Staff Report
Prepared for the

SAN FRANCISCO BAY AREA HAZARDOUS WASTE MANAGEMENT CAPACITY ALLOCATION COMMITTEE

Final Report
August 28, 1991

SAN FRANCISCO BAY AREA HAZARDOUS WASTE MANAGEMENT CAPACITY ALLOCATION COMMITTEE

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Claude Van Marter

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Suzanne R. Larson	Project Manager
Ray Brady	Technical Assistance
Rita Chang	Research Assistant
Lisa Biow	Programmer
Lorrie Firm	Administrative Assistant

If you have questions or comments about this report, please contact Suzanne Larson of ABAG at (415) 464-7977.

Staff Report
to the
SAN FRANCISCO BAY AREA HAZARDOUS WASTE MANAGEMENT CAPACITY ALLOCATION COMMITTEE
August 28, 1991

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INTRODUCTION and HIGHLIGHTS

The Hazardous Waste Management Capacity Allocation Committee was created to develop a regional approach for providing hazardous waste management facility capacity in the region. As part of that effort the committee has developed a Capacity Allocation Plan. In order to implement this Capacity Allocation Plan, we have collected the latest available data on generation of hazardous wastes and hazardous waste management capacity within the nine Bay Area County region. The purpose of this report is to provide the committee with the data, an explanation of its development, and the capacity allocation plan using the new data. We present information in two major sections: I. Data Development and II. The Capacity Allocation Plan.

The Data Development section explains the collection, reduction and analysis of the 1989 data, the year 2000 projections data and the capacity needs analysis. The Capacity Allocation Plan section applies the Capacity Allocation Formula using the data from the data development process.

A major objective of this planning effort is to estimate the need for future off-site hazardous waste management facilities. A summary outcome of this needs determination is illustrated in Figure I-1 by county and Figure I-2 by treatment method. The region's hazardous waste management capacity is expected to total over 300,000 tons per year in 2000 based on existing facilities only. The region's projected capacity requirement is about 495,000 tons per year in 2000. As a region it is estimated that we will have an overall capacity deficit of about 190,000 tons in 2000 if existing capacity remains operable and no new capacity is added. Figure I-1 and I-2 display both existing and proposed capacity.

In Chapter II the Capacity Allocation Plan is applied, and the responsibility for filling the regional capacity deficit gap is distributed among counties based upon their contribution to the deficit. The outcome of this planning effort will be adopted when the Committee has reviewed the data and negotiated an acceptable allocation.

I. DATA DEVELOPMENT

A. HAZARDOUS WASTE GENERATION FOR 1989

In order to plan for the management of hazardous wastes within the region, it is necessary to define current management practices. Data have been collected by ABAG in order to define the current picture as accurately as possible. The "current" situation is based on information from 1989. This section describes the data and presents our best estimate of the current picture. Note that tables may not always appear to sum correctly; this is due to rounding of numbers.

1. Data Collection and Methodology

The California Department of Health Services (DHS) collects and maintains a data base known as the Hazardous Waste Information System (HWIS). The off-site hazardous waste information contained in the HWIS is based on hazardous waste manifest data. All manifested shipments of hazardous waste within the state are recorded in this computerized data set. The following data elements are included in the database:

Generator: EPA number, company name and address
Transporter: EPA number, company name and address
Disposal or Treatment Facility: EPA number, company name and address
California waste category number
Disposal method
Quantity of waste
Quantity unit
Shipment date
Receipt date

The DHS keeps the data in two separate computer files depending on the completeness of the manifest information entered. The data on less complete manifests are contained

in the "suspense" file until they are updated when more complete and accurate information becomes available. The "history" file contains the more complete and accurate data. Data from both of these files for the entire state were combined by DHS and provided to ABAG on magnetic tape.

In order to categorize waste quantities by industrial classification, it was necessary to assign the appropriate Standard Industrial Classification (SIC) for each waste generator on the database for each county. The SIC codes were determined and entered into the computer by ABAG staff.

Each county's staff reviewed printouts of the data for accuracy and completeness. County staff requested changes to the data when errors were identified and submitted written documentation to ABAG describing errors. ABAG corrected the database based upon the county staff review. Thus the manifest data utilized in this report are more accurate and complete than the original data DHS supplied to ABAG.

2. Wastes Shipped Off-site: Types and Volumes

A wide variety of hazardous wastes are shipped off-site for treatment and disposal in the San Francisco Bay Area. All legally shipped hazardous wastes are tracked using the Uniform Hazardous Waste Manifest document as the basic system tracking element. This system provides the "cradle to grave" monitoring of hazardous waste flows throughout the nation. The DHS HWIS is the computerized system that records all shipments within the state. These data form the basis for the information on 1989 presented in this section.

In the original Tanner planning effort, the DHS recommended that data be presented using seventeen (17) waste groups. This requires that the eighty (80) California Waste Codes identified on the manifest data be aggregated into these seventeen groups. The California Waste Categories to Waste Group conversion table is provided in Appendix 1.

Table I-1 describes the quantities of hazardous waste shipped off-site by generators in the San Francisco Bay Area by the 17 waste groups for 1989. A total of 372,492 tons of hazardous waste were shipped off-site by generators in the Bay Area. Waste Oil represents the largest waste group generated in 1989 with 88,314 tons, accounting for 24% of the total regional waste stream. Miscellaneous wastes represent the next largest group with 21% of the regional waste stream. Miscellaneous wastes include materials such as asbestos, inorganic solids, pharmaceuticals, empty containers, photo and lab wastes. Contaminated soils represent about 14% of the region's generation of hazardous wastes.

Table I-2 shows the off-site hazardous waste contribution from each county in the region. Contra Costa County generators manifested more waste than any other county. Upon review we see that Contra Costa County contributes about 26%, followed by Santa Clara County at about 22% and Alameda at 21% of the total regional manifested waste stream for 1989. San Francisco contributes 11% (40,617 tons) and all the other counties contribute less than 10%, with the smallest contribution from Napa County with less than 1,500 tons in 1989.

Table I-3 illustrates the contribution from each county in the region by the 17 waste groups. For the waste oil group, in particular, waste quantities can be attributed to a county other than the generating county because of the "modified manifest" technique commonly used for manifesting waste oil. We feel that on a regional basis, that is, summing all the county waste oil generation numbers together, the effect of this is minimal. However, on a county by county basis, this could have substantial impact on generation figures. In fact, for Alameda County, the data were corrected for one major oil recycler (California Oil Recyclers) that receives waste oil from many sources to more accurately reflect the actual generation within Alameda County and other counties in the region. Some 20,000 tons of waste oil were generated from sources outside the county although they appeared in the original manifest data as being generated in Alameda County for California Oil Recyclers. These wastes where distributed to the actual county of generation and Table I-3 displays this corrected information. For two smaller oil

facilities in Alameda County about 9,000 tons of waste oil were subtracted to reflect actual generation for Alameda County. However, data were not available in these two cases to distribute waste oil to other counties of generation.

3. Small Quantity Generators (SQG) & Household Hazardous Wastes (HHW)

Small quantity generators of hazardous waste include businesses and households that generate less than 1000 kg/month. In this report when we use the term small quantity generator (SQG), we mean businesses that generate less than 1000 kg/month. Household hazardous wastes will be discussed separately.

We did not estimate SQG & HHW for 1989. These data were available for 1986 for each county in their respective county hazardous waste management plan. In the next section (I.B.) we will present the projections to 2000 and discuss the SQG & HHW component of the region's projected total.

B. FUTURE HAZARDOUS WASTE GENERATION ESTIMATES

To plan for future management of hazardous wastes, future generation rates must be systematically estimated. Since economic activity generates the vast majority of hazardous waste in our environment, any planning activity to estimate future hazardous waste production requires estimating economic growth, as well as information on the impacts of present and future technology on hazardous waste generation. ABAG has developed a methodology to estimate future hazardous waste streams that are a result of economic activity in the nine counties of the San Francisco Bay Area Region. These forecasts are limited to industry and do not include estimates of hazardous wastes that households generate. We developed a separate method to estimate the contribution to the overall hazardous waste picture by households. These are presented in Section I.B.4. This chapter discusses the waste level forecasts and presents estimated hazardous waste generation data for the region in the year 2000.

1. Hazardous Waste Projections for Off-site Managed Wastes: Sources, Methods, and Limitations

ABAG staff has developed a model to forecast hazardous waste generation levels by both large and small quantity industrial generators based on industry-specific economic output levels. This model was applied to manifested wastes only. Technical Memoranda Numbers 2 and 4 contained in Appendix 2 provide a complete description of the forecast methodology, although for this forecast we used Projections 90 and 1989 waste manifest data which differs from the descriptions in the technical memos. Briefly, the method uses economic activity projections by county and industry sector for the year 2000 to predict waste generation levels for that year. The model assumes that the relationship between waste generation and economic output level in 1989 remains constant throughout the forecast period. The following calculation was performed for each sector on a county-by-county basis:

$$\frac{\text{waste produced in '89 in tons}}{\text{economic output '89 in constant '82 \$}} \times \text{output in 2000} = \text{waste produced in 2000}$$

Table I-4 summarizes the projections data by waste group for the year 2000. The first column in Table I-4 shows the manifested waste generation data for 1989 "the 1989 base case" used to produce the projections. This "base case" estimate represents all manifested waste during 1989 except for wastes generated from site clean-ups (contaminated soils and asbestos). The second column "no reduction" estimates hazardous waste production without accounting for any waste minimization potential above the amount in use in 1989. None of the estimates presented here include household or small quantity generators which disposed of unmanifested waste. Household wastes will be discussed in Section I.B.4. Small quantity generator projections will be discussed in Section I.B.3. Detailed projections data based upon the 1989 manifest information on individual counties have been distributed to county staff. By the end of the century, manifested industrial hazardous waste production is estimated to total 389,346 tons, with no reduction scenario incorporated into the estimate. This estimate assumes that waste will be generated at the same rate per unit of output as in 1989, so only technology changes and waste reduction programs that were in existence in 1989 are incorporated into this estimate.

Waste reduction efforts that generators were practicing in 1989 will influence the forecast but any waste reduction efforts (i.e., technology changes, recycling, improved housekeeping) implemented following 1989 are not accounted for in these projections. This scenario for year 2000 estimates will be referred to as the "No Reduction" case. However, since waste reduction is a central element of this planning process, we have incorporated a waste reduction estimate into the second stage of our forecast.

2. Incorporation of Waste Reduction Potential into the Year 2000 Estimates

We have presented a methodology for estimating manifested waste generation figures for the year 2000. As previously described, these projections do not incorporate any estimates of future waste reduction potential. Predicting waste reduction levels is extremely difficult because they can be influenced by many factors. Most often, these factors are economic and regulatory pressures. The price of treating or disposing of waste affects the behavior of industry. As the cost of treatment or disposal increases, economic incentives to reduce hazardous waste in the production process increases. Correspondingly, regulations place legal constraints on the production of hazardous wastes. The combination of the two factors could have substantial impacts on hazardous waste generation in the production process.

Local governments can provide incentives for waste reduction to their local generators. The Ventura County experience (Ventura County, 1987) is an excellent example of the impact local government can have on waste reduction efforts. In Ventura, a 70% reduction of volume of hazardous waste going to land disposal was realized over a two-year period. The Ventura example is very specific: a small number of generators were responsible for a large percentage of this overall decrease. The San Francisco Bay Area Regional Hazardous Waste Management Capacity Allocation Committee encourages local governments to become involved in similar efforts. Many counties and cities within the region have initiated waste reduction programs. But the question still remains: "How much waste reduction is likely to occur in the San Francisco Bay Region between now and 2000?"

Both the full committee and the Technical Advisory Subcommittee (TAC) have discussed this issue extensively. The TAC recommended that the committee continue to use the 25% reduction scenario as previously adopted. This recommendation was based on several considerations:

1) We have no new information to form the basis for recommending a change.
2) By using the latest HWIS data (1989) as the base case for the projections, we have incorporated any reduction that has occurred through that year in our projection estimate.
3) The California Capacity Assurance Plan forecast includes an overall 25% reduction estimate in waste generation for the entire state.

Table I-4 shows the year 2000 projections for manifested wastes (excluding clean-up waste) incorporating this 25% reduction scenario with a total of 292,010 tons. The 25% reduction number represents the Committee's best estimate of future generation from manifested waste in the region.

3. Small Quantity Generator (SQG) Projections

During the original Tanner planning effort, each county estimated the amount of hazardous waste produced by SQGs in 2000. These data were used in this effort. They are presented in Table I-5 by county and for the region with both the no reduction and 25% reduction scenarios. We estimate 165,670 tons to be generated by SQGs in 2000 using the 25% reduction scenario.

4. Household Hazardous Waste Projections

We used the same methodology as we utilized in the previous Tanner planning effort to project the contribution to the hazardous waste stream from households for 2000. We estimated that 6.63 pounds per household per year was generated and multiplied that volume by household projection figures (ABAG, Projections 90) for the year 2000. Table I-6 shows these estimates by waste group and by county. The total contribution from households is estimated to be about 8,600 tons. Santa Clara County is predicted to contribute the largest amount with about 23% (1,978 tons) of the total regional household hazardous waste stream. Alameda County is a close second with about 21% (1,814 tons).

5. Summary: Projection Estimates for 2000

Table I-7 summarizes the projected industrial contribution using the no reduction and 25% reduction scenarios and household hazardous waste contribution for each county and the region. To calculate the total industrial waste contribution we used the SQG projection for waste oil and did not add in the manifested waste oil projection with the exception of Contra Costa County. We selected this approach to define the total industrial waste stream projection because we felt double-counting was considerable in the two projection figures (SQG and off-site manifest) for waste oil. For Contra Costa County we used only the manifest projection because the SQG projection was incomplete since it included data only on route service haulers. A total of 385,738 tons is projected to be generated in the year 2000 with a 25% reduction for industrial wastes. Santa Clara County is projected to make the largest contribution to the regional total at about 29%. Alameda County follows at about 21% of the regional hazardous waste total. Contra Costa County is estimated to contribute about 15% followed by the rest of the region's counties with contributions of 10% or less apiece.

C. OFF-SITE HAZARDOUS WASTE MANAGEMENT CAPACITY NEEDS ANALYSIS FOR 2000

One of the major objectives of this planning effort is to assess the future need for off-site hazardous waste management capacity. In Section I.B. we estimated future generation rates for the year 2000 for off-site managed, SQG, and household hazardous wastes. In this section we will use these projections to estimate facility needs in the year 2000. This "needs analysis" will address capacity requirements for off-site managed wastes including manifested wastes, SQG waste and household hazardous waste.

In order to analyze the need for off-site management facility capacity we needed to convert waste group projections into suitable treatment method categories. We used the generalized treatment categorization as recommended in the DHS Technical Reference Manual from the Guidelines for the Preparation of Hazardous Waste Management Plans (1987). Thus, each waste group was converted to the primary treatment method as suggested by DHS. In order to predict the volume of residuals left by each method (ultimately resulting in the capacity requirement for residuals repository facilities) we applied the following factors to the generalized treatment methods:

Generalized Treatment Method	Residual Factor
Aqueous Treatment - Organic	10%
Aqueous Treatment - Metals/Neutralization	50%
Incineration	10%
Solvent Recovery	20%
Oil Recovery	20%
Other Recycling	10%
Stabilization	120%

In the Technical Reference Manual from the State Department of Health Services, no residuals factor was given for the treatment category of "Other Recycling." In our earlier planning effort we used a 10% residual factor for recycling. We used the same factor in this effort.

Assessing the need for future off-site waste management facility capacity is fraught with difficulties. Future needs can be impacted by a variety of unknown factors that could dramatically alter the actual situation. One of the major factors in assessing future needs is the accuracy of the generation projections data. We feel the generation projections (as presented in Section I.B.) are the best available data and that the assumptions incorporated into the methodology are reasonable. These data form the basis of this needs assessment.

The following sections present the results of the regional needs determination.

C.1. Projected Off-site Capacity Requirements

Tables I-8, I-9, and I-10 display estimated capacity requirements for manifested, SQG, and household hazardous wastes, respectively for the year 2000. Individual county contributions are also shown. In Tables I-10 and I-11, household hazardous wastes included in the miscellaneous waste category (Section B, Table I-6) are categorized into the residuals category for the needs analysis. It was not possible to further categorize these wastes.

The data are combined in Table I-11 yielding the total regional estimated off-site capacity requirement. When we compiled the projections data on manifested, SQG, and household wastes, several adjustments were made in order to present a more accurate estimate of capacity requirements. These adjustments are explained here and are noted on the table. We recognized that waste oil was the major component of the small quantity generator waste stream, and that it was very likely that double counting of this waste type would occur if we summed the waste oil component from both the manifested and SQG estimates. Our solution to this dilemma was to use the waste oil SQG estimate only, with one exception. For Contra Costa County the manifest estimate was included for waste oil since the SQG estimate was considered incomplete.

Without incorporating a waste reduction factor (Table I-11), the estimated total maximum treatment capacity requirement is 656,725 tons in the year 2000. The largest treatment method needed will be oil recovery. The industrial waste reduction factor is included in Table I-12. When we account for anticipated industrial waste reduction of 25% the total treatment capacity requirement is about 495,000 tons in the year 2000. The industrial contribution is estimated at just over 485,000 tons and the household contribution at just over 9,500 tons.

C.2. Projected Off-site Treatment Capacity

Table I-13 and I-14 display the projected off-site treatment capacity by county and for the region in the year 2000. These data were extracted from the county hazardous waste management plans and reviewed for accuracy by county staff. Table I-13 shows expected capacity based on existing facilities that are expected to be operational in 2000. Table I-14 shows proposed facilities. Zero capacity is estimated for only one category, residuals

repository, when we consider both proposed and existing facility capacity. Based on total capacity available from current facilities (Table I-13) the regional capacity is estimated at about 305,000 tons. If all proposed facilities become active, the region will have an estimated capacity of about 555,000 tons (Table I-16). The important issue is whether capacity will meet projected requirements. This will be addressed in the next section.

C.3. Off-site Capacity Needs Determination

Tables I-15 and I-16 display the facility capacity needs determination for the region using a 25% reduction scenario for industrial wastes. These tables present capacity surpluses and deficits based upon the difference between estimated capacity requirements and projected treatment capacity. The needs determination for the year 2000 was calculated based upon a simple comparison between the estimated required capacity and the available capacity. The required capacity is the total waste generated -- as projected with a 25% industrial waste reduction -- reorganized into treatment categories. The available capacity is based on currently existing facilities or proposed facilities. Thus, the net capacity needed is just the difference between facility capacity and the estimated treatment capacity required. Table I-15 displays estimates of needed capacity based only upon existing facilities and Table I-16 combines existing and proposed facilities.

In reviewing the 25% industrial reduction scenario needs assessment based on existing facilities (Table I-15) we see that overall for the region we estimate a deficit in capacity of about 190,000 tons. When we include proposed facilities (Table I-16) we see an overall surplus in capacity of about 60,000 tons. Clearly, a substantial difference exists depending upon whether proposed facilities become operational. The largest deficit is estimated for residuals repositories. We estimate the deficit for residuals to be about 113,000 tons.

C.4. Conclusion

The regional estimated need for off-site treatment capacity will be substantially influenced by waste minimization practices and actual capacity available. However, with our best estimate of waste reduction potential at 25%, over all hazardous waste generating industries, three categories of treatment still show substantial deficits even when we include proposed capacity. These are residuals repositories, other recycling and stabilization. To be conservative, if we examine need based only on existing facilities we

see capacity deficits in all treatment method groups except the solvent recovery, aqueous organic, and oil recovery categories. The largest deficit is in the residuals category (over 113,000 tons). Figures I-1 and I-2 display the needs analysis for 2000 by county and by treatment group, respectively, with the 25% industrial reduction scenario.

In Chapter II we will use the data presented here in the Capacity Allocation Plan.

TABLE I-1
QUANTITIES OF HAZARDOUS WASTE SHIPPED OFF-SITE BY GENERATORS IN THE SAN FRANCISCO BAY REGION BY WASTE CATEGORY FOR 1989, IN TONS

WASTE GROUP	REGION	%
Waste Oil	88,314	24%
Halogenated Solvents	5,059	1%
Non-Halogenated Solvents	38,006	10%
Organic Liquids	8,486	2%
Pesticides	495	0%
PCB's & Dioxins	7,699	2%
Oily Sludges	21,516	6%
Halogenated Organic Sludges & Solids	1,387	0%
Non-Halogenated Organic Sludges & Solids	13,623	4%
Dye and Paint Sludges & Resins	3,971	1%
Metal-Containing Sludges	7,448	2%
Metal-Containing Liquids	15,464	4%
Cyanide & Metal Liquids	248	0%
Non-Metallic Inorganic Liquids	18,301	5%
Non-Metallic Inorganic Sludges	11,871	3%
Contaminated Soil	51,960	14%
Miscellaneous	77,963	21%
Unknown Wastes	680	0%
TOTAL	372,492	100%

The above figures taken from the county reports printed on June 6 and 7, 1991.

File Name: TABLE1A.WQ1

Date: June 12, 1991

TABLE I-2
QUANTITIES OF HAZARDOUS WASTE SHIPPED OFF-SITE IN THE SAN FRANCISCO BAY REGION FOR 1989 BY COUNTY OF ORIGIN, IN TONS

COUNTY	QUANTITY (TONS/YEAR)	PERCENT
Alameda	78,066	21%
Contra Costa	95,615	26%
Marin	3,374	1%
Napa	1,419	0%
San Francisco	40,617	11%
San Mateo	27,033	7%
Santa Clara	80,712	22%
Solano	26,262	7%
Sonoma	19,393	5%
TOTAL	372,492	100%

The above figures are taken from the county reports printed on June 6, 1991 & June 7, 1991.

File Name: TABLE2.WQ1

Date: June 13, 1991

TABLE I-3
QUANTITIES OF HAZARDOUS WASTE SHIPPED OFF-SITE BY GENERATORS IN THE SAN FRANCISCO BAY REGION BY WASTE GROUP AND COUNTY OF ORIGIN FOR 1989, IN TONS

WASTE GROUP	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Waste Oil	23,235	16,511	1,837	586	4,115	6,576	25,135	6,945	3,373	88,314
Halogenated Solvents	1,236	114	9	3	16	379	2,793	71	440	5,059
Non-Halogenated Solvents	6,461	1,454	100	63	1,366	13,897	11,281	328	3,056	38,006
Organic Liquids	2,114	2,299	86	0	304	1,840	1,363	160	319	8,486
Pesticides	2	159	0	0	2	317	4	12	0	495
PCB's & Dioxins	5,827	338	21	21	299	352	615	71	155	7,699
Oily Sludges	4,532	9,785	2	72	1,329	141	1,923	3,587	146	21,516
Halogenated Organic Sludges & Solids	592	567	0	0	0	46	167	9	7	1,387
Non-Halogenated Organic Sludges & Solids	5,667	3,692	196	0	1,190	221	1,980	546	133	13,623
Dye and Paint Sludges & Resins	1,213	1,113	1	1	49	112	337	1,137	8	3,971
Metal-Containing Sludges	221	992	1	0	28	155	5,934	76	42	7,448
Metal-Containing Liquids	3,014	680	20	1	509	560	7,231	3,249	201	15,464
Cyanide & Metal Liquids	45	0	0	0	0	7	192	0	5	248
Non-Metallic Inorganic Liquids	2,522	2,067	29	4	3,367	434	9,507	307	65	18,301
Non-Metallic Inorganic Sludges	116	150	0	0	150	10	167	2,570	8,708	11,871
Contaminated Soil	9,896	31,950	801	343	4,244	817	1,813	1,303	794	51,960
Miscellaneous	11,269	23,686	272	327	23,586	1,148	10,005	5,740	1,930	77,963
Unknown Wastes	107	58	0	0	65	24	263	151	13	680
TOTAL	78,066	95,615	3,374	1,419	40,617	27,033	80,712	26,262	19,393	372,492

The above figures taken from the county reports printed on June 6 and 7, 1991.

File Name: TABLE1A.WQ1

Date: June 12, 1991

TABLE I-4
1989 BASE CASE AND HAZARDOUS WASTE GENERATION PROJECTIONS FOR OFF-SITE MANAGED WASTES BY WASTE GROUP IN THE SAN FRANCISCO BAY REGION FOR 2000, IN TONS

WASTE GROUP	1989 BASE*	PROJECTIONS	
		NO REDUCTION	25% REDUCTION
Waste Oil	88,314	113,502	85,127
Halogenated Solvents	5,059	7,457	5,592
Non-Halogenated Solvents	38,006	64,726	48,544
Organic Liquids	8,486	12,151	9,113
Pesticides	495	987	740
PCBs and Dioxins	7,699	9,057	6,792
Oily Sludges	21,516	27,830	20,873
Halogenated Organic Sludges & Solids	1,387	2,250	1,687
Non-Halogenated Organics Sludges & Solids	13,623	18,278	13,708
Dye & Paint Sludges & Resins	3,971	6,213	4,660
Metal-Containing Sludges	7,448	11,042	8,282
Metal-Containing Liquids	15,464	21,216	15,912
Cyanide & Metal Liquids	248	304	228
Non-Metallic Inorganic Liquids	18,301	24,423	18,317
Non-Metallic Inorganic Sludges	11,871	15,610	11,707
Contaminated Soil	0	0	0
Miscellaneous Wastes	39,930	53,323	39,992
Unknown Wastes	680	980	735
TOTAL	282,500	389,346	292,010

*These numbers represent the base case upon which the projections were calculated. They exclude manifested one-time generators and clean-up wastes, including contaminated soils and asbestos.

File Name: TABLE4.WQ1

Date: June 13, 1991

TABLE I-5
HAZARDOUS WASTE GENERATION PROJECTIONS FOR SMALL QUANTITY GENERATORS BY COUNTY OF ORIGIN IN THE SAN FRANCISCO BAY REGION FOR 2000, IN TONS

COUNTY	NO REDUCTION	25% REDUCTION
Alameda	50,241	37,681
Contra Costa	18,597	13,948
Marin	8,950	6,713
Napa	13,431	10,073
San Francisco	17,978	13,484
San Mateo	14,860	11,145
Santa Clara	71,519	53,639
Solano	9,045	6,784
Sonoma	16,272	12,204
TOTAL	220,893	165,670

File Name: TABLE5A.WQ1

Date: June 13, 1991

TABLE I-6
HAZARDOUS WASTE GENERATION PROJECTIONS* FOR HOUSEHOLD HAZARDOUS WASTES BY WASTE GROUP AND COUNTY FOR THE SAN FRANCISCO BAY REGION FOR 2000, IN TONS

HOUSEHOLD HAZARDOUS WASTE

WASTE GROUP	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Waste Oil	252	168	50	23	151	123	275	69	85	1,196
Halogenated Solvents	11	7	2	1	7	5	12	3	4	52
Non-Halogenated Solvents	27	18	5	2	16	13	30	7	9	129
Organic Liquids	13	8	3	1	8	6	14	3	4	60
Pesticides	85	57	17	8	51	42	93	23	29	404
Non-Halogenated Organic Sludges & Solids	80	53	16	7	48	39	87	22	27	379
Dye & Paint Sludges & Resins	339	226	67	31	204	166	370	93	114	1,609
Non-Metallic Inorganic Liquids	258	172	51	23	155	126	281	70	86	1,222
Miscellaneous Wastes	749	499	148	68	449	366	817	205	251	3,553
TOTAL	1,814	1,209	357	165	1,088	886	1,978	496	609	8,604
PERCENTAGE	21%	14%	4%	2%	13%	10%	23%	6%	7%	100%

*Number of households from ABAG Projections '90

File Name: TABLE6A.WQ1
Date: June 13, 1991

TABLE I-7
HAZARDOUS WASTE GENERATION PROJECTIONS IN THE SAN FRANCISCO BAY REGION BY COUNTY OF ORIGIN FOR 2000, IN TONS

	INDUSTRIAL				HOUSEHOLD	TOTAL	
			TOTAL			INDUSTRIAL + HOUSEHOLD	
COUNTY	MANIFESTED*	SQG*	NO REDUCTION	25% REDUCTION	HHW	25% REDUCTION ~	PERCENT
Alameda	56,516	50,241	106,757	**80,068**	**1,814**	**81,882**	21%
Contra Costa	72,185	4,187	76,372	**57,279**	**1,209**	**58,488**	15%
Marin	856	8,950	9,806	**7,355**	**357**	**7,712**	2%
Napa	237	13,431	13,668	**10,251**	**165**	**10,416**	3%
San Francisco	13,236	17,978	31,214	**23,410**	**1,088**	**24,498**	6%
San Mateo	37,130	14,860	51,990	**38,993**	**886**	**39,879**	10%
Santa Clara	72,812	71,519	144,331	**108,248**	**1,978**	**110,226**	29%
Solano	22,443	9,045	31,488	**23,616**	**496**	**24,112**	6%
Sonoma	20,950	16,272	37,222	**27,917**	**609**	**28,526**	7%
TOTAL	296,365	206,483	502,848	**377,136**	**8,602**	**385,738**	100%

*Waste oil quantities were subtracted from the manifested waste stream total for all counties except Contra Costa to avoid double counting of this waste group. For Contra Costa County the SQG waste oil number is subtracted and the manifest projection is used. See explanation in section I.B.5.

~Twenty-five percent reduction for industrial wastes only. HHW are not reduced.

File Name: TABLE7.WQ1
Date: June 24, 1991

TABLE I-8
PROJECTED CAPACITY REQUIREMENTS FOR OFF-SITE HAZARDOUS WASTE FACILITIES FOR 2000 BY COUNTY OF ORIGIN IN THE SAN FRANCISCO BAY REGION, IN TONS (NO REDUCTION SCENARIO)

MANIFESTED WASTES ONLY

TREATMENT METHOD	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Aqueous Treatment-Organic	2	376	0	0	2	700	6	18	0	1,103
Aqueous Treatment-Metals	8,129	4,104	64	6	4,048	1,213	23,577	4,332	579	46,053
Incineration	16,625	8,234	264	24	1,910	993	4,033	3,227	487	35,797
Solvent Recovery	12,033	2,153	157	81	1,841	30,460	20,081	566	4,809	72,182
Oil Recovery	35,770	32,795	1,948	702	6,418	6,617	37,121	14,900	5,061	141,332
Other Recycling	10,632	19,618	369	53	3,490	3,356	12,448	5,097	2,978	58,040
Stabilization	2,646	4,822	2	1	202	195	9,452	4,687	11,852	33,858
Residuals	19,526	17,651	518	168	4,459	8,761	36,220	11,717	16,833	115,853
TOTAL	105,363	89,753	3,321	1,035	22,370	52,295	142,938	44,544	42,600	504,219

File Name: TABLE8.WQ1

Date: June 13, 1991

TABLE I-9
PROJECTED CAPACITY REQUIREMENTS FOR OFF-SITE HAZARDOUS WASTE FACILITIES FOR 2000 BY COUNTY OF ORIGIN IN THE SAN FRANCISCO BAY REGION, IN TONS
(NO REDUCTION SCENARIO)

SMALL QUANTITY GENERATOR WASTES ONLY

TREATMENT METHOD	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Aqueous Treatment-Organic	216	131	77	476	95	32	345	0	90	1,462
Aqueous Treatment-Metals	2,837	391	197	210	611	130	4,636	234	2,413	11,659
Incineration	1,036	119	136	338	844	256	819	504	341	4,393
Solvent Recovery	2,222	776	794	629	1,630	647	3,341	590	1,103	11,732
Oil Recovery	34,938	14,410	6,551	9,487	13,050	12,389	54,002	4,826	12,013	161,666
Other Recycling	5,993	2,761	1,193	2,264	1,214	1,361	7,850	997	300	23,933
Stabilization	2,999	9	2	27	534	45	526	1,894	12	6,048
Residuals	13,174	3,545	1,711	2,468	4,098	2,891	15,319	3,623	3,918	50,746
TOTAL	63,415	22,142	10,661	15,899	22,076	17,751	86,838	12,668	20,190	271,639

File Name: TABLE5A.WQ1

Date: June 13, 1991

TABLE I-10
PROJECTED CAPACITY REQUIREMENTS FOR OFF-SITE HAZARDOUS WASTE FACILITIES FOR 2000 BY COUNTY OF ORIGIN IN THE SAN FRANCISCO BAY REGION, IN TONS (NO REDUCTION SCENARIO)

HOUSEHOLD HAZARDOUS WASTE ONLY

TREATMENT METHOD	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Aqueous Treatment-Organic	85	57	17	8	51	42	93	23	29	405
Aqueous Treatment-Metals	258	172	51	23	155	126	281	70	86	1,222
Incineration	419	279	83	38	252	205	457	115	141	1,989
Solvent Recovery	38	25	7	3	23	18	42	10	13	179
Oil Recovery	252	168	50	23	151	123	275	69	85	1,196
Other Recycling	13	8	3	1	8	6	14	3	4	60
Stabilization	0	0	0	0	0	0	0	0	0	0
Residuals*	988	658	195	90	593	482	1,077	270	331	4,685
TOTAL	2,053	1,367	406	186	1,233	1,002	2,239	560	689	9,736

*Residuals figures include miscellaneous household wastes (3,553 tons), which cannot be categorized by treatment method.

File Name: TABLE6A.WQ1

Date: June 13, 1991

TABLE I-11
TOTAL PROJECTED CAPACITY REQUIREMENTS FOR OFF-SITE HAZARDOUS WASTE FACILITIES FOR 2000 BY COUNTY OF ORIGIN IN THE SAN FRANCISCO BAY REGION, IN TONS (NO REDUCTION SCENARIO, IN TONS)

MANIFESTED WASTES + SQG WASTES + HOUSEHOLD WASTES

TREATMENT METHOD	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Aqueous Treatment-Organic	303	564	94	484	148	774	444	41	119	2,970
Aqueous Treatment-Metals	11,224	4,667	312	239	4,814	1,469	28,494	4,636	3,079	58,934
Incineration	18,080	8,632	483	400	3,006	1,454	5,309	3,846	968	42,179
Solvent Recovery	14,293	2,954	958	713	3,494	31,125	23,464	1,166	5,926	84,094
Oil Recovery*	41,462	32,963	6,603	9,581	14,873	12,676	57,135	9,187	12,324	196,803
Other Recycling	16,638	22,387	1,565	2,318	4,712	4,723	20,312	6,097	3,282	82,032
Stabilization	5,645	4,831	4	28	736	240	9,978	6,581	11,865	39,907
Residuals ~	27,788	18,972	2,034	2,600	8,200	10,843	45,764	13,489	20,115	149,806
TOTAL	135,433	95,970	12,052	16,364	39,983	63,304	190,899	45,042	57,678	656,725

The above figures are a composite of Table I-8, Table I-9, and Table I-10.

*Waste oil quantities were subtracted from the manifested waste stream total for all counties except Contra Costa county to avoid double counting of this waste group. For Contra Costa County the SQG waste oil number is subtracted and the manifest projection for waste oil is used. See section I.C.1 for discussion.

~ Residuals figures include miscellaneous household wastes (3,553 tons), which cannot be categorized by treatment method.

File Name: TABLE11.WQ1

Date: June 24, 1991

TABLE I-12
HAZARDOUS WASTE CAPACITY PROJECTIONS IN THE SAN FRANCISCO BAY REGION BY COUNTY OF ORIGIN FOR 2000, IN TONS

	INDUSTRIAL CAPACITY REQUIRED				HOUSEHOLD	TOTAL REQUIRED CAPACITY	
	REQUIRED FOR	REQUIRED FOR	TOTAL REQUIRED CAPACITY		REQUIRED FOR	INDUSTRIAL + HOUSEHOLD	
COUNTY	MANIFESTED*	SQG*	NO REDUCTION	25% REDUCTION	HHW	25% REDUCTION ~	PERCENT
Alameda	69,965	63,415	133,380	**100,035**	**2,053**	102,088	21%
Contra Costa	89,753	4,850	94,603	**70,952**	**1,367**	72,319	15%
Marin	985	10,661	11,646	**8,735**	**406**	9,141	2%
Napa	279	15,899	16,178	**12,133**	**186**	12,319	2%
San Francisco	16,674	22,076	38,750	**29,063**	**1,233**	30,296	6%
San Mateo	44,551	17,751	62,302	**46,726**	**1,002**	47,728	10%
Santa Clara	101,821	86,838	188,659	**141,495**	**2,239**	143,734	29%
Solano	31,814	12,668	44,482	**33,362**	**560**	33,922	7%
Sonoma	36,799	20,190	56,989	**42,742**	**689**	43,431	9%
TOTAL	392,642	254,348	646,990	**485,242**	**9,735**	494,977	100%

*Waste oil quantities were subtracted from the manifested waste stream total for all counties except Contra Costa to avoid double counting of this waste group. For Contra Costa County the SQG waste oil number is subtracted and the manifest projection is used. See explanation in section I.B.5.

~ Twenty-five percent reduction for industrial wastes only. HHW are not reduced.

File Name: TABLE7.WQ1
Date: July 15, 1991

TABLE I-13
PROJECTED OFF-SITE TREATMENT CAPACITY FOR 2000
BY COUNTY AND THE SAN FRANCISCO BAY REGION, IN TONS

EXISTING FACILITIES WITH EXPECTED OPERATION IN 2000

TREATMENT METHOD	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Aqueous Treatment-Organic	0	0	0	0	0	8,400	0	0	0	8,400
Aqueous Treatment-Metals	15,000	0	0	0	0	0	20,876	0	0	35,876
Incineration	0	0	0	0	0	0	0	0	0	0
Solvent Recovery	2,520	0	0	0	0	50,400	26,460	0	0	79,380
Oil Recovery	63,000	0	0	0	76,000	20,160	0	0	0	159,160
Other Recycling	0	0	2,430	0	0	0	361	0	0	2,791
Stabilization	0	0	0	0	0	0	21,036	0	0	21,036
Residuals	0	0	0	0	0	0	0	0	0	0
TOTAL	80,520	0	2,430	0	76,000	78,960	68,733	0	0	306,643

This table does not include hazardous waste transfer or storage facilities; it includes only facilities for treatment or disposal.

File Name: TABLE12A.WQ1

Date: July 31, 1991

TABLE I-14
PROJECTED OFF-SITE TREATMENT CAPACITY FOR 2000
BY COUNTY AND THE SAN FRANCISCO BAY REGION, IN TONS

PROPOSED FACILITIES

TREATMENT METHOD	ALAMEDA	C.COSTA	MARIN	NAPA	S.F.	S.MATEO	S.CLARA	SOLANO	SONOMA	REGION
Aqueous Treatment-Organic	0	0	0	0	0	26,600d	0	0	0	26,600
Aqueous Treatment-Metals	0	11,850c	0	0	0	0	6,200f	0	0	18,050
Incineration	0	142,000b	0	0	0	0	0	0	0	142,000
Solvent Recovery	0	2,850c	0	0	0	10,080e	0	0	0	12,930
Oil Recovery	33,600a	8,600c	0	0	0	0	0	0	0	42,200
Other Recycling	0	6,700c	0	0	0	0	0	0	0	6,700
Stabilization	0	0	0	0	0	0	0	0	0	0
Residuals	0	0	0	0	0	0	0	0	0	0
TOTAL	33,600	172,000	0	0	0	36,680	6,200	0	0	248,480

Proposed Facilities:

a: Evergreen Environmental Services Waste Oil Recovery

b: Rhone Poulenc incinerator

c: Erickson treatment station

d: Romic Chemical: This capacity represents combined aqueous waste treatment (equal capacity for both organic and metals removal); organic wastes represent the largest contaminant, so capacity is shown only under this method to avoid double counting. Metal removal capacity will be increased by a full 35,000 tons to match organic treatment capacity.

e: This number represents the expansion of the solvent recovery capacity planned for the Romic chemical treatment facility.

f: A new technique is to be used at the existing Safe-Way Chemical facility resulting in capacity expansion of 6, 200 tons.

Note: This table does not include hazardous waste transfer or storage facilities; it includes only facilities for treatment or disposal.

File Name: TABLE12A.WQ1

Date: July 15, 1991

TABLE I-15
NEEDS DETERMINATION FOR OFF-SITE HAZARDOUS WASTE MANAGEMENT CAPACITY* IN 2000 FOR THE SAN FRANCISCO BAY REGION, IN TONS (25% INDUSTRIAL REDUCTION SCENARIO)

EXISTING FACILITES ONLY

TREATMENT METHOD	CAPACITY	GENERATION ~	NET
Aqueous Treatment-Organic	8,400	2,329	6,071
Aqueous Treatment-Metals	35,876	44,506	(8,630)
Incineration	0	32,132	(32,132)
Solvent Recovery	79,380	63,115	16,265
Oil Recovery	159,160	147,901	11,259
Other Recycling	2,791	61,541	(58,750)
Stabilization	21,036	29,930	(8,894)
Residuals	0	113,526	(113,526)
TOTAL	306,643	494,979	(188,336)

*The capacity for this table is based only on current facilities expected to be in operation in the year 2000. In this table the generation numbers are the total waste generated (as projected with 25% reduction for industrial wastes), organized into treatment categories. Capacity is the treatment capacity based on the facilities already in operation. Net is the difference between capacity and generation, with a positive number representing excess capacity available and a negative number indicating additional facility capacity will be necessary.

~ Waste oil quantities were subtracted from the manifested waste stream total for all counties except Contra Costa county to avoid double counting of this waste group. For Contra Costa County the SQG waste oil number is subtracted and the manifest projection for waste oil is used. See section I.C.1 for discussion.

File Name: TABLE12A.WQ1

Date: July 31, 1991

TABLE I-16
NEEDS DETERMINATION FOR OFF-SITE HAZARDOUS WASTE MANAGEMENT CAPACITY* IN 2000 FOR THE SAN FRANCISCO BAY REGION, IN TONS (25% INDUSTRIAL REDUCTION SCENARIO)

EXISTING + PROPOSED FACILITIES

TREATMENT METHOD	CAPACITY	GENERATION ~	NET
Aqueous Treatment-Organic	35,000	2,329	32,671
Aqueous Treatment-Metals	53,926	44,506	9,420
Incineration	142,000	32,132	109,869
Solvent Recovery	92,310	63,115	29,195
Oil Recovery	201,360	147,901	53,459
Other Recycling	9,491	61,541	(52,050)
Stabilization	21,036	29,930	(8,894)
Residuals	0	113,526	(113,526)
TOTAL	555,123	494,979	60,144

*The capacity is based on the total projected capacity for 2000, including both current and proposed facilities. In this table the generation numbers are the total waste generated (as projected with 25% reduction for industrial wastes), organized into treatment categories. Capacity is the treatment capacity based on existing and proposed facilities expected to be in operation. Net is the difference betwen capacity and generation, with a positive number representing excess capacity available and a negative number indicating additional facility capacity will be necessary.

~ Waste oil quantities were subtracted from the manifested waste stream total for all counties except Contra Costa county to avoid double counting of this waste group. For Contra Costa County the SQG waste oil number is subtracted and the manifest projection for waste oil is used. See section I.C.1 for discussion.

File Name: TABLE12A.WQ1

Date: July 31, 1991

Figure I-1
Required vs. Existing & Proposed Capacity For The Year 2000 By County (25% Reduction)

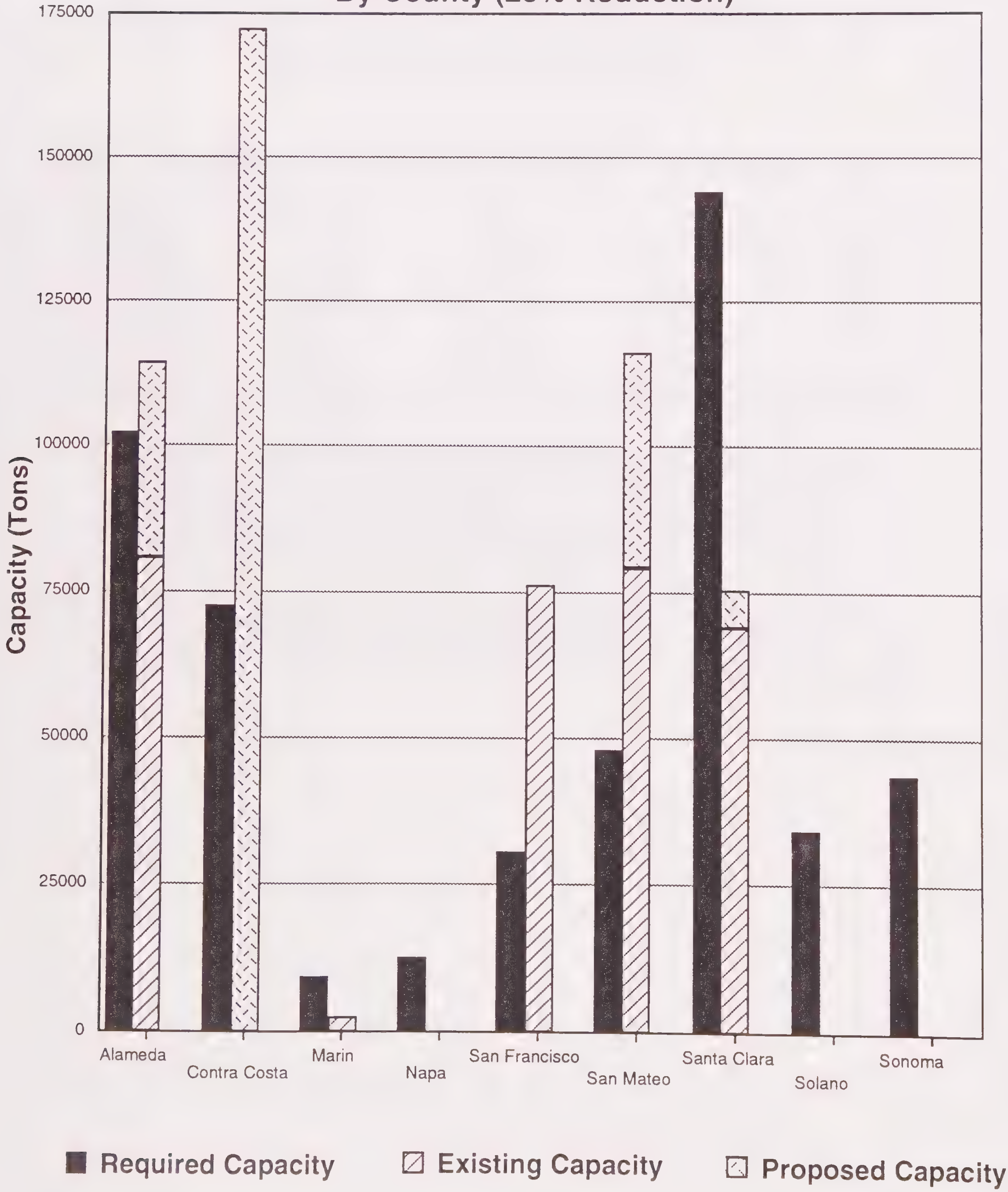
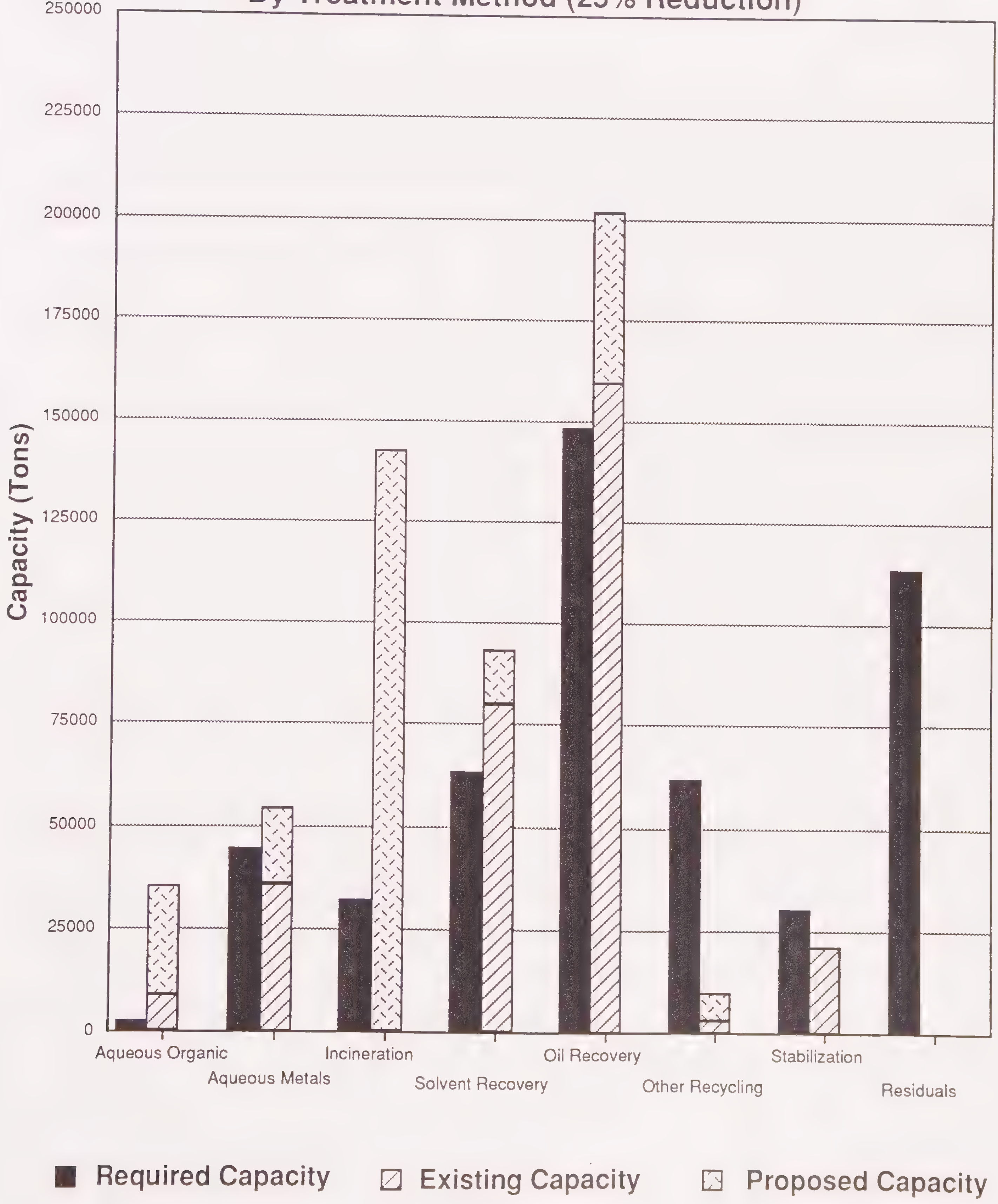


Figure I-2
Required vs. Existing & Proposed Capacity
For The Year 2000
By Treatment Method (25% Reduction)



II. CAPACITY ALLOCATION PLAN

The Capacity Allocation Plan is a method developed by the Committee to allocate responsibility among counties to provide hazardous waste management capacity within the region. This section describes the Capacity Allocation Plan and works through the process using the data presented and described in the previous sections on Data Development. The Capacity Allocation Plan consists of two major elements: the allocation formula and the reality check.

A. THE CAPACITY ALLOCATION PLAN: RULES AND ASSUMPTIONS

These rules and assumptions are presented to lay the framework for this planning effort. They provide guidance to the Committee on how to initiate and what to include in this process.

1. Consistency

The allocation plan must be consistent with individual county hazardous waste management plans.

2. Waste Reduction

Waste minimization will be encouraged to the fullest extent possible. The Committee will stay abreast of efforts by local governments in the Bay Area to minimize waste production. During any data projection updates we will need to re-evaluate how to include a reduction scenario. For this planning period we will use the 25% industrial reduction scenario as described previously in Section I.

3. Flexibility

The Committee, acting in a clearinghouse capacity, shall be updated at least every 6 months on the status of proposed management facilities and management facility closures. The Notice of Intent (NOI) process has loopholes so we will be relying on county staff to keep the Committee informed of important changes or proposed changes within each county.

A formal update and review of this process should coincide with the 3-year planning schedule outlined in the Tanner legislation for Hazardous Waste Management Plans. The Capacity Allocation Plan can be amended at any time the Committee votes to amend the Plan.

4. Data

The data is unlikely to ever be an accurate reflection of the real world. The data will only be used as a relative scale for allocating responsibility. In this first round of negotiations we will use the 1989 generation figures as a base year and recalculate the generation projections to the year 2000.

ABAG will make all the generation and projections data available for county updates.

5. Facility Ranking

In the Capacity Allocation Plan we will use the waste minimization hierarchy as a gross risk assessment of facility types to "rank" types of facilities. We will use this ranking to assign county responsibility in the following order:

Recycling and Reuse
Treatment

Incineration

Residual Repository

6. Reality Check

Once the allocation formula has been applied the "reality check" will be performed. The reality check is meant to give the Committee more information for assessing whether or not the allocation formula is reasonable. It will provide information to the Committee to assess whether or not to adjust the outcome of the capacity allocation formula. Are the allocations reasonable and should adjustments be incorporated to better reflect the "real world"?

The Reality Check Guidelines are presented below in the Section II C.

B. THE ALLOCATION FORMULA

The allocation formula describes how capacity will be allocated using aggregate generation and aggregate capacity figures for each county. This is a three step process as outlined below.

<u>Step 1</u>

Eliminate from consideration those counties that exceed their fair share of capacity. This is based upon their aggregate capacity minus estimated aggregate quantity generated.

IF (Total Capacity - Total Generation) = +,
THEN eliminate county from further consideration.
COUNTY HAS MET ITS FAIR SHARE

IF (Total Capacity - Total Generation) = -,
THEN include county in Step 2.
COUNTY HAS NOT MET ITS FAIR SHARE

Using our latest data for the nine Bay Area counties (see Table II-1), this would eliminate San Francisco and San Mateo Counties, from further consideration.

AND

Eliminate from further capacity consideration those treatment groups where the region exceeds its fair share of facility capacity. This is based upon treatment group specific aggregate capacity minus aggregate quantity generated.

FOR EACH TREATMENT GROUP:

IF (Total Capacity - Total Generation) = +,
THEN eliminate this treatment group from further consideration.
THE REGION HAS MET ITS FAIR SHARE

IF (Total Capacity - Total Generation) = -,
THEN include Treatment group in Step 2.
THERE IS A REGIONAL DEFICIT

Using our current data (Table II-1), this would eliminate the Aqueous Organic, Solvent Recovery, and Oil Recovery treatment groups.

Step 2

In this step we rank counties based on their aggregate contribution to the regional capacity deficit; from the largest contribution to the regional capacity deficit to the smallest. The relative ranking for our counties using our current data would be:

Largest Deficit: Santa Clara County - rank 9
Contra Costa County - rank 8

	Sonoma County - rank 7
	Solano County - rank 6
	Alameda County - rank 5
	Napa County - rank 4
Smallest Deficit:	Marin County - rank 3

Counties with no capacity deficits are ranked separately according to the amount of excess capacity they contribute to the region. This results in:

NO Deficit Counties

Smallest capacity excess:	San Mateo - rank 2
Largest capacity excess:	San Francisco - rank 1

<u>Step 3</u>

In this step we assign county responsibility for specific treatment groups. Only those counties and treatment groups with a need for capacity are considered. Counties are assigned a treatment group based upon their contribution to the overall regional capacity deficit. Those counties contributing the most to the deficit are assigned treatment groups based upon our facility ranking as described in Assumption 5, above: counties contributing the most to the overall regional deficit are matched with treatment groups that are lower on the waste minimization hierarchy.

a) Starting with Residuals (lowest on hierarchy) assign responsibility for this category to the county that contributes the largest deficit to the regional total. Using our current data this would be Santa Clara County.

b) The next treatment type to consider is Incineration. Contra Costa County would be assigned responsibility for this treatment group.

c) Stabilization = Sonoma County

d) Aqueous Metals = Solano County

e) Other Recycling = Alameda, Napa and Marin Counties

("Other Recycling" includes treatment for the waste groups: Organic Liquids, Empty Containers, Metal Dust, Photo Processing Waste, Laboratory Wastes, and Household Wastes, etc.)

This completes the Allocation Formula application. Now the Reality Check is performed to evaluate the allocation formula outcome giving the Committee additional information in considering whether or not to make adjustments to this allocation.

C. REALITY CHECK GUIDELINES FOR THE CAPACITY ALLOCATION PLAN

1. Introduction

The purpose of the Reality Check is to assess the appropriateness of the outcome of the allocation formula. Application of the allocation formula is the first step in this planning process. The subsequent Reality Check has been developed to establish a process to evaluate the outcome of the allocation formula.

The reality check establishes a process where various factors are considered. We have attempted to quantify major issues in a broad fashion to assure that they will be given proper consideration in this planning process. In some instances, subjective determinations will have to be made in the process of assigning certain numeric values when there are no hard data available. To assist in this process we have defined both **quantitative** factors and **qualitative** factors. The quantitative factors assess the hazard associated with the wastes generated (Factor 1) in each county and the hazard associated with the wastes accepted at facilities within each county (Factor 2). The qualitative

factors include public perception of existing capacity in a county, the proximity of waste generated within the region to the treatment capacity a county is allocated and the ability of existing facilities to increase capacity. These factors are fully described below.

Generally the process described herein is limited to identification of gross errors needing consideration rather than as a fine tuning method. The purpose of the Reality Check evaluation is to determine whether an adjustment to the outcome of the capacity allocation formula should be considered. Wherever applicable and available, the same data used in the Capacity Allocation Plan are used for the reality check.

2. The Reality Check Guidelines

A numeric value will be assigned for each county in each factor described below. For factors 1, 2, 3, and 4 counties will be ranked according to their score. In this way we can examine the relative ranking of the counties for these factors. As presented here, each factor (both quantitative and qualitative) can stand alone and the Technical Advisory Committee has recommended that they be evaluated independently, with the exception of Factor 3 which combines Factors 1 and 2.

The quantitative Factors 1, 2 and 3 are compared against the ranking of counties from largest to smallest capacity deficit including the zero capacity deficit counties in the capacity allocation formula. The evaluation of these factors is considered following the facility ranking (Step 2 of the Capacity Allocation Plan) prior to the allocation of facilities (Step 3 of the Capacity Allocation Plan) giving more information on whether or not a counties' relative ranking should be changed. The qualitative factors (4, 5 and 6) are meant to give pertinent information that can be used to evaluate the Capacity Allocation Plan in more subjective terms.

3. Quantitative Factors

FACTOR 1: Waste Generation by Hazard Category by County (Table II-2)

To assess this factor, we divide the projected wastes generated from each county into broad hazard categories by using the 3-digit Hazardous Waste Code Numbers from the manifest projections data. Three hazard categories are defined; slight, moderate and high hazard. The hazard classification of waste codes is attached in Appendix 3. We then assign weights to each category and multiply the weight (1, 10, or 100) for each type of waste by the tonnage or total volume of waste in the category for each county. This weights the tonnages that will then be summed to give a final numeric value for each county. Counties are then ranked from one to nine based on their final tonnage score.

We will use the latest manifest projection figures to the year 2000 for this calculation. A low tonnage score would get a low ranking (closer to 1) and high tonnage score would get a high ranking (closer to 9). A low ranking gives more credit to a county.

Hazard Category Weights:
1 = Slight Hazard
10 = Moderate Hazard
100 = High Hazard

Santa Clara County is rank 9 followed by Alameda County (Table II-2). Napa County receives the lowest rank 1.

FACTOR 2: Capacity Utilization by Hazard Category by County (Table II-3)

To assess this factor we retrieved data from DHS on each treatment and disposal facility within the region. These data identified tons of waste received for 1989 by 3-digit California hazardous waste manifest code at each facility. Only those wastes that were identified as treated or disposed are used in this analysis; transfer wastes are not included.

Using the same weights as we used in Factor 1 we multiplied the weight (1, 10, or 100) for each type of waste code received by a facility by the tonnage total in the category. We then summed hazard categories giving a numeric total for each facility. The facility totals were summed to give totals for each county. This factor examines actual usage patterns based on wastes received in 1989 by facilities in the region.

In this case, a low tonnage score would get a high rank (closer to 9) with no capacity counties receiving the highest rank (9), and a high tonnage score would get a low rank (closer to 1). A low ranking gives more credit to a county.

Since four counties have zero capacity they all receive rank 9: Contra Costa, Napa, Solano and Sonoma. The lowest rank county is Alameda (rank = 4).

Note that data for Gibson Oil in San Mateo is not included, since no information from the Hazardous Waste Information System was available for 1989.

FACTOR 2A: Availability of Capacity by Hazard Category by County (Table II-4)

Factor 2A is derived from Factor 2. In this factor we estimate weighted tonnages for facilities taking into account the total permitted capacity of

the facility. In Factor 2 capacity that was actually utilized in 1989 was considered. In Factor 2A we perform an adjustment using the 1989 data on waste received by a facility to estimate the likely distribution of manifest waste codes for the total permitted capacity at the facility. By using the percent distribution on wastes received for each facility, available from the DHS data, we can multiply permitted capacity by percent to get estimated tonnages in each manifest code. By using the percent distribution of waste received we estimate tonnages in each category for a facility's entire permitted capacity. We can then categorize these estimates into hazard categories, multiply by the same weights used in factor 2, sum tonnages for each facility and sum facilities to get a county total.

In this case, a low tonnage score would get a high rank (closer to 9) with no capacity counties receiving the highest rank (9), and a high tonnage score would get a low rank (closer to 1). A low ranking gives more credit to a county.

Note that data for Gibson Oil in San Mateo County is not included.

FACTOR 3: Combination of Factors 1 & 2 and Factors 1 & 2A (Table II-5)

To take into account the combination of factors 1 & 2 and 1 & 2A we will subtract total weighted capacity (2 or 2A) from total weighted generation for each county (factor 2 minus factor 1). Counties would then be ranked according to their weighted contribution to the regional capacity deficit. The county with the largest contribution to the weighted capacity deficit would get the highest rank (9). The county with the smallest contribution to the weighted regional deficit would get the lowest rank (1).

A low ranking is more desirable.

4. Qualitative Factors

FACTOR 4: Public Perception of Current Treatment or Disposal Facility Capacity in Each County (Table II-6)

Using the same ranking hierarchy as in the capacity allocation formula (Step 3) assign a numeric value for current capacity. Use percentages for more than one type of capacity.

A low score gets a low rank (closer to 1), a high score gets a high rank, (closer to 9). A low rank gives a county more credit since the county is already supplying a less desirable type of capacity, based on public perception.

1 = Residual/Incineration
3 = Treatment
5 = Recycling
7 = NO Capacity

Since four counties have zero existing capacity they are all ranked 9. For counties that contribute capacity; Marin = rank 8, San Francisco = rank 7, San Mateo = rank 6, Alameda = rank 5, and Santa Clara = rank 4 (Table II-6).

FACTOR 5: Proximity of Waste Source Within the Region to County for which the Treatment Capacity is Allocated (Table II-7)

This factor would be applied following the allocation of treatment facility capacity to counties using the capacity allocation formula. We will measure the percentage of regional waste which is generated within the county for which treatment capacity is allocated. In this way we can assess how much of the region's capacity

need is contributed by the county assigned responsibility for that type of treatment method.

Example: **total county need for capacity**

$$\frac{\textbf{total county need for capacity}}{\textbf{total regional need for capacity}} \times 100$$

Table II-7 shows the percentage contribution to the regional need for each treatment group by county.

FACTOR 6: Actual -vs- Permitted Capacity and Ability of Existing Facilities Within a County to Increase Capacity (Table II-8)

Permitted capacity is usually the design capacity of a facility based upon engineering limitations. Most facilities use less capacity than their maximum design. We use permitted capacity in the capacity allocation planning process. Actual capacity can vary significantly depending on many factors including economic considerations and acceptable waste profiles.

We can compare the actual to permitted capacity to assess the likelihood of expansion. Those counties that have a lot of permitted capacity that is not being used would have a high ability to expand. Some facilities might consider expanding by increasing work shifts. Individual counties would need to investigate and document their conclusions on the ability of specific facilities to expand.

Factors 2 and 2A use permitted capacity and an estimate of actual, that we can display here to examine how they differ. Table II-8 presents this information by county.

D. RENEGOTIATION OF THE CAPACITY ALLOCATION PLAN

Both closures and openings of hazardous waste management facilities can impact the capacity allocation plan. This planning process must be flexible enough to accommodate changes - as new management capacity comes on-line or previously existing capacity is no longer available, as well as when significant changes in generators occur. The following section describes how to approach incorporating capacity changes from expansions, new facilities and closures in the capacity allocation plan.

1. Management Facility Expansions

Some expansions will not require a new permit from the local land-use authority and other expansions will require a local land-use permit. Capacity will be examined by the committee in 2 steps. In step 1 the Committee will consider capacity that has been approved by all permitting bodies. In step 2 the capacity will be added into the capacity allocation formula once the facility is operable and available to accept waste.

2. New Management Facilities

A three tier process for inclusion of new facility capacity is suggested. The first step would be a preliminary warning from the local land use authority that an application for a land-use permit is <u>deemed complete</u>. The actual capacity would not be included in the Capacity Allocation Plan at this point but the Committee would then be made aware of a serious effort to site a facility.

For the second-step the following four elements must be complete:

1. Local Land use permit
2. DHS/EPA permit
3. Water Board Permit
4. Authority to construct from the Air District
5. Building Permits issued

These permits finalize the authorization process to construct and operate a facility. When these steps are complete, Committee members will be notified for information purposes only of the imminent likelihood of a facility coming on-line.

In step three, when the facility is actually able to accept waste, the County would be allocated the "permitted" capacity in the capacity allocation formula.

3. **Management Facility Closures**

Closures should be included as they occur - when the business is no longer operational.

4. **Generators**

Significant additions or losses in generators for a county might require reallocation. We will examine any changes of + or - 10% in a waste code for the region to determine whether a reallocation is reasonable on a yearly basis. Changes of 10% in an individual county should be brought to committee staff for consideration.

TABLE II-1
NEEDS DETERMINATION
FOR ALL TREATMENT METHODS*
(25% INDUSTRIAL REDUCTION, YEAR 2000, IN TONS)

Treatment Method (tons/year)

COUNTY	AQUEOUS ORGANIC CAP	AQUEOUS ORGANIC GEN	AQUEOUS ORGANIC NET (+/-)	AQUEOUS METALS CAP	AQUEOUS METALS GEN	AQUEOUS METALS NET (+/-)	INCINERATION CAP	INCINERATION GEN	INCINERATION NET (+/-)	SOLVENT RECOVERY CAP	SOLVENT RECOVERY GEN	SOLVENT RECOVERY NET (+/-)
Alameda	0	249	(249)	15,000	8,483	6,517	0	13,665	(13,665)	2,520	10,729	(8,209)
Contra Costa	0	437	(437)	0	3,543	(3,543)	0	6,544	(6,544)	0	2,222	(2,222)
Marin	0	75	(75)	0	246	(246)	0	383	(383)	0	720	(720)
Napa	0	365	(365)	0	185	(185)	0	310	(310)	0	536	(536)
San Francisco	0	124	(124)	0	3 649	(3,649)	0	2 318	(2,318)	0	2,626	(2,626)
San Mateo	8 400	591	7,809	0	1,133	(1,133)	0	1,142	(1,142)	50,400	23,348	27,052
Santa Clara	0	356	(356)	20,876	21,441	(565)	0	4 096	(4 096)	26,460	17,609	8,851
Solano	0	36	(36)	0	3,495	(3,495)	0	2,913	(2,913)	0	877	(877)
Sonoma	0	96	(96)	0	2,330	(2,330)	0	762	(762)	0	4,448	(4,448)
REGION	8 400	2,329	6,072	35,876	44,506	(8,629)	0	32,133	(32,133)	79,380	63,115	16 265

COUNTY	OIL RECOVERY CAP	OIL RECOVERY GEN	OIL RECOVERY NET (+/-)	OTHER RECYCLING CAP	OTHER RECYCLING GEN	OTHER RECYCLING NET (+/-)	STABILIZATION CAP	STABILIZATION GEN	STABILIZATION NET (+/-)	RESIDUALS CAP	RESIDUALS GEN	RESIDUALS NET (+/-)	TOTAL CAP	TOTAL GEN	TOTAL NET (+/-)
Alameda	63,000	31,159	31,841	0	12,482	(12,482)	0	4,234	(4 234)	0	21,100	(21,100)	80,520	102,101	(21 581)
Contra Costa	0	24,764	(24,764)	0	16 792	(16,792)	0	3,623	(3,623)	0	14,401	(14,401)	0	72,326	(72,326)
Marin	0	4,965	(4 965)	2,430	1,174	1 256	0	3	(3)	0	1,577	(1,577)	2,430	9,143	(6 713)
Napa	0	7 192	(7,192)	0	1,739	(1,739)	0	21	(21)	0	1,974	(1,974)	0	12,322	(12,322)
San Francisco	76 000	11,192	64 808	0	3 536	(3,536)	0	552	(552)	0	6 305	(6,305)	76 000	30 302	45,698
San Mateo	20,160	9 537	10 623	0	3 544	(3 544)	0	180	(180)	0	8,259	(8 259)	78,960	47,734	31 226
Santa Clara	0	42,920	(42,920)	361	15,238	(14,877)	21,036	7,484	13,552	0	34,605	(34 605)	68,733	143,749	(75,016)
Solano	0	6,908	(6,908)	0	4 573	(4 573)	0	4 935	(4,935)	0	10,187	(10,187)	0	33,924	(33,924)
Sonoma	0	9,265	(9,265)	0	2,462	(2,462)	0	8,899	(8,899)	0	15,173	(15,173)	0	43,435	(43,435)
REGION	159,160	147,902	11 258	2 791	61,540	(58,749)	21,036	29,931	(8,895)	0	113,581	(113,581)	306,643	495 036	(188 393)

Cap = Capacity based on existing facilities
Gen = Estimated hazardous waste generation organized into treatment methods
Net = Capacity-Generation

File Name: [illegible]
Date: July 31 1991

Table II-1

DATA ASSUMPTIONS AND LIMITATIONS

1) The year 2000 projection estimates are based on the 1989 manifest data. The projections assume that the relationship between waste generation and economic output level in 1989 remains constant throughout the forecast period. In addition the following specific assumptions of the projection model which result in the deficiencies described below should be noted:

ASSUMPTIONS

A. Economic growth in the Bay Area counties will follow the assumptions of Projections 90.

B. Industry trading patterns found in the base year of the input-output model will not change over the forecast period.

C. The technical relationship between waste generation by type and the dollar output of the selected industries will not change over the forecast period. The model assumes no efficiencies for the base case. The technical relationship is linear.

DEFICIENCIES

A. Fixed technical relationships in the trading patterns of industries over the forecast period.

B. No increased efficiencies which could either internalize waste generation in the production process or reduce its production over time due to more efficient process technology.

2) The likelihood of reduction varies according to type of waste and treatment category. These differences are not accounted for in the reduction scenario figures.

3) Regulatory requirements, government policy, and economic factors will affect the volume of waste generated.

TABLE II-2
REALITY CHECK
FACTOR 1
2000 PROJECTED TONS* WEIGHTED BY HAZARD CATEGORY

COUNTY	SLIGHT HAZARD (x1)	MODERATE HAZARD (x10)	HIGH HAZARD (x100)	TOTAL	RANK
Alameda	11,095	664,304	831,160	1,506,559	8
Contra Costa	5,969	649,195	121,287	776,451	7
Marin	201	25,460	5,564	31,225	2
Napa	23	8,152	2,906	11,081	1
San Francisco	883	159,926	103,547	264,356	3
San Mateo	2,830	392,519	145,234	540,583	6
Santa Clara	6,960	915,294	822,910	1,745,164	9
Solano	5,690	268,273	31,006	304,969	4
Sonoma	865	241,757	72,656	315,278	5
TOTAL	34,516	3,324,880	2,136,270	5,495,666	

*Based on manifest projections and does not include 1x generators or waste categories 611 or 151.

File Name: REAL2A.WQ1

Date: June 13, 1991

TABLE II-3
REALITY CHECK
FACTOR 2
1989 UTILIZED TSD FACILITY CAPACITY
WEIGHTED BY HAZARD CATEGORY

COUNTY	SLIGHT HAZARD (x1)	MODERATE HAZARD (x10)	HIGH HAZARD (x100)	TOTAL	RANK
Alameda	59	461,405	122,155	583,619	4
Contra Costa	0	0	0	0	9
Marin	0	600	0	600	8
Napa	0	0	0	0	9
San Francisco	7,985	114,488	0	122,473	7
San Mateo*	4,206	251,560	41,249	297,015	5
Santa Clara	712	88,689	168,499	257,900	6
Solano	0	0	0	0	9
Sonoma	0	0	0	0	9
TOTAL	12,962	916,742	331,903	1,261,607	

*Does not include capacity for Gibson Oil in San Mateo County (20,160 tons Oil Recovery).

File Name: REAL2A.WQ1

Date: August 19, 1991

TABLE II-4
FACTOR 2A
1989 AVAILABLE TSD FACILITY CAPACITY
WEIGHTED BY HAZARD CATEGORY

COUNTY	SLIGHT HAZARD	MODERATE HAZARD	HIGH HAZARD	TOTAL	RANK
Alameda	88	777,642	267,390	1,045,120	5
Contra Costa	0	0	0	0	9
Marin	0	24,300	0	24,300	8
Napa	0	0	0	0	9
San Francisco	31,228	447,716	0	478,944	7
San Mateo*	8,302	496,801	81,732	586,835	6
Santa Clara	4,377	520,077	1,014,853	1,539,307	4
Solano	0	0	0	0	9
Sonoma	0	0	0	0	9
TOTAL	43,995	2,266,536	1,363,975	3,674,506	

*Does not include capacity for Gibson Oil in San Mateo County (20,160 tons Oil Recovery).

File Name: REAL2A.WQ1

Date: August 19, 1991

TABLE II-5
REALITY CHECK
FACTOR 3

COUNTY	FACTOR 2	FACTOR 1	NET (FACTOR 2 - FACTOR 1)	RANK	FACTOR 2A	FACTOR 1	NET FACTOR 2A - FACTOR 1	RANK
Alameda	583,619	1,506,559	(922,940)	8	1,045,120	1,506,559	(461,439)	8
Contra Costa	0	776,451	(776,451)	7	0	776,451	(776,451)	9
Marin	600	31,225	(30,625)	2	24,300	31,225	(6,925)	3
Napa	0	11,081	(11,081)	1	0	11,081	(11,081)	4
San Francisco	122,473	264,356	(141,883)	3	478,944	264,356	214,588	1
San Mateo*	297,015	540,583	(243,568)	4	586,835	540,583	46,252	2
Santa Clara	257,900	1,745,164	(1,487,264)	9	1,539,307	1,745,164	(205,857)	5
Solano	0	304,969	(304,969)	5	0	304,969	(304,969)	6
Sonoma	0	315,278	(315,278)	6	0	315,278	(315,278)	7
TOTAL	1,261,607	5,495,666	(4,234,059)		3,674,506	5,495,666	(1,821,160)	

*Does not include capacity for Gibson Oil in San Mateo County (20,160 tons Oil Recovery).

File Name: REAL2A.WQ1

Date: August 19, 1991

TABLE II-6
REALITY CHECK
FACTOR 4

COUNTY						SCORE	RANK
Alameda	(80,520)						
	Aqueous Metals:	19%	x	3	=	0.56	
	Solvent Recovery:	3%	x	5	=	0.16	
	Oil Recovery:	78%	x	5	=	3.91	
		Alameda			=	4.63	5
Contra Costa							
	No Capacity:	100%	x	7	=	7.00	9
Marin	(2,430)						
	Other Recycling:	100%	x	5	=	5.00	
		Marin			=	5.00	8
Napa							
	No Capacity:	100%	x	7	=	7.00	9
San Francisco	(76,000)						
	Oil Recovery:	100%	x	5	=	5.00	
		San Francisco			=	5.00	7
San Mateo	(78,960)						
	Aqueous Organic:	11%	x	3	=	0.32	
	Solvent Recovery:	64%	x	5	=	3.19	
	Oil Recovery	26%	x	5	=	1.28	
		San Mateo			=	4.79	6
Santa Clara	(67,333)						
	Aqueous Metals:	31%	x	3	=	0.93	
	Solvent Recovery:	39%	x	5	=	1.96	
	Stabilization:	31%	x	3	=	0.94	
		Santa Clara			=	3.83	4
Solano							
	No Capacity:	100%	x	7	=	7.00	9
Sonoma							
	No Capacity:	100%	x	7	=	7.00	9

File Name: REAL6.WQ1

Date: August 19, 1991

TABLE II-7
PERCENT CONTRIBUTION TO REGIONAL CAPACITY NEED BY TREATMENT METHOD BY COUNTY

COUNTY	AQUEOUS ORGANIC	AQUEOUS METALS	INCINERATION	SOLVENT RECOVERY	OIL RECOVERY	OTHER RECYCLING	STABILIZATION	RESIDUALS	TOTAL
Alameda	11%	19%	43%	17%	21%	**20%**	14%	19%	21%
Contra Costa	19%	8%	**20%**	4%	17%	27%	12%	13%	15%
Marin	3%	1%	1%	1%	3%	**2%**	0%	1%	2%
Napa	16%	0%	1%	1%	5%	**3%**	0%	2%	2%
San Francisco	5%	8%	7%	4%	8%	6%	2%	6%	6%
San Mateo	25%	3%	4%	37%	6%	6%	1%	7%	10%
Santa Clara	15%	48%	13%	28%	29%	25%	25%	**30%**	29%
Solano	2%	**8%**	9%	1%	5%	7%	16%	9%	7%
Sonoma	4%	5%	2%	7%	6%	4%	**30%**	13%	9%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%

Bold % - Identifies a counties' allocated treatment method.

File Name: REAL1A.WQ1

Date: July 19, 1991

TABLE II-8
UTILIZED -VS- PERMITTED CAPACITY IN 1989
BY COUNTY, IN TONS

COUNTY	UTILIZED*	PERMITTED
Alameda		
Evergreen Oil**	43,542	63,000
Entech Recovery	3,786	15,000
Baron Blakeslee	93	2,520
Marin		
Mikey Corp.	60	2,430
San Francisco		
H & H Ship	19,434	76,000
San Mateo		
Romic Chemical Corp.	29,778	58,800
Gibson Oil	NA***	20,160
Santa Clara		
South Bay Chemical	28	1,651
ECS	155	24
Van Waters & Rogers	387	1,533
Solvent Services	10,576	64,936
Micro Metallics	11	87
Boliden Metech	19	250
Bayday Chemical	91	252
TOTAL	107,960	306,643

*Utilized Capacity: Tonnage of known waste categories received by a facility as recorded in the DHS TSD M.5 reports (excludes Disposal Method: Transfer Station).

**Evergreen Oil Capacity includes all American Oil, California Oil Recyclers and Evergreen Environmental Services.

***NA: Not available for this report.

File Name: REAL8.WQ1

Date: August 19, 1991

REFERENCES

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APPENDICES

Appendix 1

Conversion of California Waste Categories to Waste Groups

CONVERSION OF CALIFORNIA WASTE CATEGORIES TO WASTE GROUPS

Waste Group	California Waste Category	
1. Waste Oil	221	Waste Oil and Mixed Oil
	223	Unspecified Oil Containing Waste
2. Halogenated Solvents	211	Halogenated Solvents
	741	Liquids With Halogen. Org. Comp. > 1000 mg/l
3. Non-Halogenated Solvents	212	Oxygenated Solvents
	213	Hydrogen Solvents
	214	Unspecified Solvent Mixtures
4. Organic Liquids	133	Aqueous with Total Organics > 10%
	134	Aqueous with Total Organics < 10%
	341	Organic (Nonsolvents) Liquids with Halogens
	342	Organic Liquids with Metals
	343	Unspecified Organic Liquid Mixtures
5. Pesticides	231	Pesticide Rinse Water
	232	Pesticides and Pesticide Production Waste
6. Dioxins	261	Polychlorinated Biphenyls
	731	Liquids With PCBs > 50 mg/l
	801	Waste Potentially Containing Dioxins
7. Oily Sludges	222	Oil/Water Separation Sludge
	352	Other Organic Solids
	481	Tetraethyl Lead Sludge
8. Halogenated Organic Sludges & Solids	251	Still Bottoms with Halogenated Organics
	351	Organic Solids with Halogens
	451	Degreasing Sludge
	751	Solids with Halogen. Org. Comp. > 1000 mg/kg
9. Non-Halogenated Organic Sludges & Solids	241	Tank Bottom Waste
	252	Other Still Bottom Waste

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* California Department of Health Services, Toxic Substances Control Division. Technical Reference Manual for the Preparation of Hazardous Waste Management Plans, June 30, 1987.

	321	Sewage Sludge
	471	Paper Sludge/Pulp
	491	Unspecified Sludge Waste
	571	Fly Ash, Bottom Ash and Retort Ash
10. Dye & Paint Sludge & Resins	271	Organic Monomer Waste
	272	Polymeric Resin Waste
	281	Adhesives
	291	Latex Waste
	461	Paint Sludge
11. Metal-Containing Sludges	171	Metal Sludge
12. Metal-Containing Liquids	111	Acids with Metals
	121	Alkaline with Metals
	132	Aqueous with Metals
	721	Liquids with Arsenic > 500 mg/l
	722	Liquids with Cadmium > 100 mg/l
	723	Liquids with Chromium > 500 mg/l
	724	Liquids with Lead > 500 mg/l
	725	Liquids with Mercury > 20 mg/l
	726	Liquids with Nickel > 134 mg/l
	727	Liquids with Selenium > 100 mg/l
	728	Liquids with Thallium > 130 mg/l
13. Cyanide & Metal Liquids	711	Liquids with Cyanides > 1000 mg/l
14. Non-Metallic Inorganic Liquids	112	Acid Without Metals
	113	Unspecified Acid
	122	Alkaline without Metals
	123	Unspecified Alkaline
	131	Aqueous with Reactive Anions
	135	Unspecified Aqueous Solution
	791	Liquids with pH < 2
15. Non-Metallic Inorganic Sludges	411	Alum and Gypsum Sludge
	421	Lime Sludge
	431	Phosphate Sludge
	441	Sulfur Sludge
	521	Drilling Mud Contaminated
16. Soil	611	Contaminated Soil
17. Miscellaneous Wastes	141	Off-Spec, Aged or Surplus Inorganics
	151	Asbestos-Containing Waste
	161	Fluid Catalytic Cracker Waste
	162	Other Spent Catalyst
	172	Metal Dust
	181	Other Inorganic Solid Waste

311 Pharmaceutical Waste
322 Biological Waste Other Than Sewage Sludge
331 Off-Spec, Aged or Surplus Organics
511 Empty Pesticide Containers > 30 gal.
512 Other Empty Containers > 30 gal.
513 Empty Containers < 30 gal.
531 Chemical Toilet Waste
541 Photochemicals/Photoprocessing Waste
551 Laboratory Waste Chemicals
561 Detergent and Soap
581 Gas Scrubber Waste
591 Baghouse Waste
612 Household Wastes

Appendix 2

Technical Memoranda

ABAG
ASSOCIATION OF BAY AREA GOVERNMENTS
Mailing Address: ■ P.O. Box 2050 ■ Oakland, CA 94604-2050

R.J. Brady

BAY AREA HAZARDOUS WASTE MANAGEMENT PLANNING

A Model to Forecast Hazardous Waste Levels In Bay Area Industries

TECHNICAL MEMORANDUM NO.2

August 1987

Revised November 1987

Overview

The objective of this technical memorandum is to provide a reasonable methodology to forecast output of hazardous wastes associated with economic activity in the Bay Area. The discussion will focus on the following:

a) estimating economic activity;
b) developing technological relationships between hazardous waste generation and industry output;
c) explicit assumptions and deficiencies, and
d) a worked example.

It is important to state from the outset that in forecasting there is no fool proof methodology. There are, however, some general rules that are followed. First, the methodology should be defensible and objective. That is, a model structure should follow a logical course relating activity and results in a way that experts can generally agree that the structure reflects a reality as close to the real world as possible. Second, assumptions should be plausible. Assumptions serve as the basis for a model structure. In hazardous waste generation, assumptions about the level of economic activity, and technological substitution in the production process which affects waste generation are made. These assumptions should reflect a reasonable relationship between process technology, output and the level of waste being generated. Finally, a good model should be transparent. Since we are dealing with much uncertainty, a technical concensus on a logical model framework and assumptions are essential. Transparency requires that model structure have a framework which can be understood and criticized for the purpose of developing an overall consensus of the reasonableness of the model results.

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The Problem

The problem is to develop a model to forecast hazardous waste generation by seventeen categories. ABAG proposes to use this model to forecast hazardous waste in the nine counties that comprise the Bay Area. The target year for the forecast is 2000. The base year is 1985 for economic data. Hazardous waste estimates by industry groups are for the year 1986. Therefore, the base year for the forecast is 1986. That is, the waste data for 1986 is not forecast from 1985, but reflects survey data from the California Department of Health Services (DHS). Forecasts of hazardous waste will be by thirty-two industry sectors in the Bay Area. Growth rates are by industry for each of the counties in the Bay Area. These sectors reflect two-digit and combinations of two-digit Standard Industrial Classification's (SIC). SIC codes were established by the Office of Budget and Management in Washington for the purpose of classifying the outputs of specific firms into an economic framework. That is, a single firm may produce more than one output. Each output is classified by economic activity, as part of the SIC accounting system.

The results of this model will be used to provide planning information on the physical level of hazardous waste that might be generated by industry in each of the nine-county's in the Bay Region for the year 2000.

The data will reflect baseline information. Pertubations on the baseline data could be developed to provide a range estimate, based upon certain technology assumptions about waste generation and efficiency in production. These assumptions would be developed in cooperation with the Task Force.

Estimating Economic Activity

Output by industry in the Bay Area reflects economic assumptions in the latest ABAG projections series, Projections 87. Projections 87 data are county specific, and economic information is by thirty-two industry sectors. Output is expressed in constant 1982 dollars. Since we are forecasting a physical unit (some form of waste), how can dollar values be used to forecast a physical unit? By use of real value growth estimates (constant dollar value sum), inflation is removed from the forecast. There is a one-to-one correspondence in real dollar output and output in physical units. Real dollar output directly reflects increased market share, efficiencies in production and overall growth in demand for the physical unit. In practical terms, it represents the dollar equivalent of a unit change in the physical output. Real dollar output does not change unless the physical level of output changes.

Therefore, real growth in the value of output can be used as a surrogate for physical output change. Real dollar value growth also considers changes in productivity. Why are productivity changes important? One common question that is asked is: "why not simply use employment growth to measure growth in hazardous waste generation?" Let's look at an example to explain why employment growth would not correlate well with hazardous waste growth. In Projections 87, regional electronics employment grows at a slower rate than in the most recent historical past in the Bay Area.

The reason for this derives from the assumption that market conditions that force this industry to become increasingly more capital (technology) intensive in the future. Therefore, between 1986 and 2000, ABAG forecasts a 23% increase in employment in this industry. If we assumed a linear relationship between employment growth and hazardous waste generation, we would assume that this waste would increase by 23%. What is wrong? First, the employment growth does not correlate well with growth in physical output because it does not consider technological change that might increase efficiency in the physical production process. This is a major deficiency of the employment method. At the same time that employment increased in electronics by 23% over the period 1986-2000, electronics dollar output rose by 61%. Why the difference? Output reflects efficiency and technology substitition which tends to reduce the demand for labor. Therefore, the unit output, reflected in constant 1982 dollars, rises per worker over this period.

Developing Output Forecasts by Sector

Industry output data are derived from the a regional input-output model for the nine-county Bay Area (see Brady and Yang). An input-output model is a structure of an economy which identifies the flow of purchases and sales between industries in that economy. The advantage of using a input-output model is that it can provide the direct and indirect impacts in changes in demand by one sector on all sectors. Dollar outputs that will be used to estimate future waste generation by county reflect this effect.

A deficiency in using the existing input-output structure of the Bay Area is that it assumes that long-term trading patterns will not change substantially. In service sectors, this assumption probably holds well. In manufacturing sectors, the assumption weakens. For example, the amount of electronics going into autos is increasing with time. A fixed technical trading structure reflecting a trading pattern at a moment in time would not pick up this change, and therefore would underestimate the potential growth over time in the demand for electronics by the auto industry. It is a problem (unfortunately) that cannot be avoided.

Therefore, the outputs prepared for the Hazardous Waste Management Plans for each county reflects the assumptions and industry trading patterns as found in Projections 87. There are deficiencies found in using this method. But it is far superior to the use of employment change as a measure of waste generation, and it is consistent with the latest regional and county economic growth forecasts.

Developing Technological Relationships between Waste Generation and Industry Output and by County

The use of input-output analysis to forecast energy demand, pollution output and waste generation is not new (see Joun; Kohn, Leontief and Miernyk). Information provided by the Department of Health Services on Hazardous Waste Generation for 1986 is being coded to reflect the SIC structure of the existing industries in the Bay Area by county.

Once the data is coded and sorted by SIC structure, output data by county for the base year will be divided into each waste stream type to develop a technical coefficient. The technical coefficient reflects the amount of waste generated per $1 of output. Although output data reflects industry activity in 1985, and waste generation data is for 1986, we do not consider this to be a problem because the method of forecasting is simply a ratio method. Second, the exercise is quite literally "a first approximation" to reality that will exist in 2000. There are too many unknown variables to say explicitly that we know what will happen in the year 2000. Given these deficiencies, the method still stands as a realistic and cost-effective technique to forecast waste generation by industry. The equation structure is presented as follows:

Mathematically, this is expressed as:

Let,

H_{iw} = the amount of hazardous waste by type generated by industry (i) in the base year.

X_{ij} = the level of output for industry (i) in the base year.

HT_i = the hazardous waste technical coefficient by each type for industry i.

Now,

$$HT_i = H_{iw} / X_{ij}.$$

The above reflects a simple ratio of output to waste. It assumes a fixed technical relationship between waste generation and output level. That is, it assumes that new technology will not increase efficiency in terms of internalization of waste into the production process. In many cases, this may be a clear oversimplification of reality.

However, as a base case, it will be useful in assessing the trend in waste generation as a function of the output of industries in each county. Professional judgement becomes critical at this stage to provide information on process changes that might affect the level of waste generation in the future.

An advantage of not using an average waste generation coefficient for the region and applying it to counties is that economic activity in selected industries of the same type may vary from county to county. For example, San Francisco has a reasonably large number of workers who work in the SIC industry structure of petroleum refining. Clearly, San Francisco does not have any refineries. By using the data from the Department of Health Services which is county specific, we are able to construct waste generation technical coefficients that reflect the unique economic structure of the industry in each county.

Once the initial condition has been defined, the technical coefficient is multiplied by the forecast year estimate to determine the level of waste by type that would be generated for the base case.

Issues such as changing mix of waste within an industry and overall process level efficiencies should be addressed by the Task Force.

Explicit Assumptions and Deficiencies of Forecasting Method

The assumptions are:

A. economic growth in the Bay Area counties will follow the assumptions of Projections.87;

B. the industry trading patterns found in the base year of the input-output model (1982) will not change over the forecast period;

C. the technical relationship between waste generation by type and the dollar output of the selected industries will not change over the forecast period. We assume no efficiencies for the base case. The technical relationship is linear.

The deficiencies are:

A. Fixed technical relationships in the trading patterns of industries over the forecast period;

B. No increased efficiencies which could either internalize waste generation in the production process or reduce its production over time, due to more efficient process technology.

Worked Example

A hypothetical worked example of a baseline forecast of hazardous waste generation is presented. The industry for which an example will be constructed will be printing and publishing (SIC 27). We will call the county, County XYZ.

The Toxic Control Division of the Department of Health Services has collected information from various firms in this SIC category. Staff has aggregated the data of the waste discharge from each firm and has aggregated it into Printing and Publishing for County XYZ. ABAG has the dollar output levels of this industry in County XYZ for 1985 and 2000.

The waste data are:	Acid Solution (PH<=2) with metals	20 tons
	Halogenerated Solvents	5 tons
	Oxygenated Solvents	5 tons
	Hydocarbon Solvents	15 tons
	Waste Oil	30 tons
	Organic Solids	50 tons
	Total	125 tons

The constant dollar output for the base year for County XYZ was estimated at $250,000,000. ABAG estimates that real growth in output will increase to $350,000,000 by the year 2000.

First we divide $250,000,000 into each waste to derive the initial condition between waste and output. Next, the technical coefficient for each waste category is multiplied by the target year output to attain the estimated increase in waste from the economic activity of the specified industry. Table 1 illustrates this process.

Table 1

Waste Generation by Type and Industry 1986 and 2000

Waste Type	Waste (1986) (A)	Waste Coefficient (B)	Waste (2000) (C)
Acid Solution	20 tons	.00000008	28 tons
Halogenerated Solvents	5 tons	.00000002	7 tons
Oxygenerated Solvents	5 tons	.00000002	7 tons
Hydrocarbon Solvents	15 tons	.00000006	21 tons
Waste Oil	30 tons	.00000012	42 tons
Organic Solids	50 tons	.00000020	70 tons
Total	125 tons	.00000050	175 tons

(al) Output 1985 $250,000,000
(b2) Output 2000 $350,000,000
Note: To find (B), divide (al) by the column vector (A). That is, (A/al).
To find (C), multiple (b2) by the column vector (B).That is,(b2 * B)

Therefore, the waste generation by category and industry is expected to increase by 40% over the forecast period, given the assumptions outlined in this paper.

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ABAG
ASSOCIATION OF BAY AREA GOVERNMENTS
Mailing Address: ■ P.O. Box 2050 ■ Oakland, CA 94604-2050

E. N. Fono, R. J. Brady

BAY AREA HAZARDOUS WASTE MANAGEMENT PLANNING

FORECASTED HAZARDOUS WASTE LEVELS IN THE YEAR 2000

TECHNICAL MEMORANDUM NO. 4

September 1987
Revised November 1987

This is the second memorandum in a series on forecasting hazardous waste generation for Bay Area industries in the year 2000. This memorandum will discuss the methodology used to collect the data, the calculations performed and the results.

Data on hazardous waste generators in 1986 were provided by the Department of Health Services. The data was listed by county and consisted of the EPA generator number, type of hazardous waste produced, tons of waste per type and a total amount of waste per generator. Only generators exporting waste for off-site treatment disposal were included. Standard Industrial Classification (SIC) codes were assigned to each waste generator (Attachment 1 lists the SIC codes). These codes are established by the Office of Management and Budget to classify economic activity by industry type. Using the Standard Industrial Classification Manual of 1972 and the 1977 supplement, SIC codes were assigned to generators for which sufficient knowledge about the nature of their business was known. Those generators we knew little or nothing about, were telephoned and questioned about their business. If we were unable to obtain information about a generator, they were assigned an SIC Code of 99, representing the unclassified section.

The results are on a county by county basis. Data was calculated using constant 1982 dollars. The data was first sorted by county and then by SIC code. SIC codes were grouped into 32 different sectors. This allowed for the largest possible amount of detail. These sectors also allowed for ABAG employment forecasts found in Projections '87 to be used for this projection study. The SIC codes were grouped as follows:

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Sector No.		SIC Codes
1.	Agriculture, Forestry, Fisheries	1, 2, 7, 8, 9
2.	Mining	10, 11, 12, 13, 14
3.	Construction	15, 16, 17
4	Ordinance	Consolidated in Sector 17
5.	Food, Beverage	20, 21
6.	Textile and Apparel Products	22, 23
7.	Lumber, Wood, Paper Products, Furniture	24, 25, 26
8.	Printing and Publishing	27
9.	Chemicals and Allied Products	28
10.	Petroleum Refining and Related Industries	29
11.	Rubber and Leather Products	30, 31
12.	Stone, Clay Glass and Concrete	32
13.	Primary Metals	33
14.	Fabricated Metals	34
15.	Non-Electrical Machinery, Computers and Office Equipment	35
16.	Electrical and Electronic Machinery, Equipment and Supplies	36
17.	Transportation Equipment	37
18.	Professional, Scientific Equipment and Miscellaneous Manufacturing	38, 39
19.	Transportation Services	40, 41, 44, 45, 46, 47
20.	Truck Transportation	42
21.	Communication	48
22.	Utilities	49
23.	Wholesale Trade	50, 51
24.	Retail Trade	52, 53, 54, 55, 56, 57, 58, 59
25.	Finance, Insurance, and Real Estate	60, 61, 62, 63, 64, 65, 66, 67
26.	Hotel and Lodging Places	70
27.	Personal and Repair Services	72, 75, 76,
28.	Business and Professional Services	73, 81, 89
29.	Amusement and Recreational Services	78, 79
30.	Health Sciences	80
31.	Education Services	82, 83, 84, 86
32.	Government	91, 92, 93 ,94, 95, 96, 97, 43

The methodology used in this study is as follows:

- o Waste generation data was obtained by waste number (assigned by the D.H.S. for each type of waste) for each generator in a county.
- o Two-digit SIC codes were assigned to each generator.
- o Waste tonnages were added together by SIC code, keeping separate all unique waste numbers.
- o SIC code data was grouped into 32 sectors, keeping separate all unique waste numbers.

- Calculation of future waste production was performed. This method was presented in Technical Memo No. 2 and is briefly described below.

For each sector, the amount of hazardous waste was added together. The calculation below was performed for each sector on a county by county basis.

$$\frac{\text{tons of waste produced in 1986}}{\text{1985 output in constant 1982 \$}} \times \text{2000 output in constant 1982 \$} = \text{tons of waste produced in 2000}$$

The output in dollars was calculated by multiplying the forecasted employment by the output/worker value for each sector. For each county, the forecasted employment was different for each year and sector. The output/worker value remained constant for all counties, but was different for each year and sector.

- Waste levels from 32 sectors were aggregated into waste levels for nine major economic categories, still keeping separate all unique waste numbers.

- Waste quantities were added together by waste number into 17 waste groups for each county. (waste groups are listed in attachment 2)

- Finally, waste totals were rearranged by unique waste number, by county, keeping separate within a waste number group, the amount generated from each SIC code.

The primary reason for aggregation of economic sectors from 32 to 9 sectors was to minimize the potential forecast errors at greater detail. Forecasting at a detail level for the year 2000 becomes problematic because in several counties a minor change in the employment could substantially affect waste generation levels. The only usefulness of the detail data is to provide information on the relative distribution of waste generation within each major economic category. The nine categories are listed below.

Category	Sector No.
Agriculture & Mining	1, 2
Construction	3
Manufacturing	5 - 18
Transportation, Communication, & Utilities	19 - 22
Wholesale Trade	23
Retail Trade	24
Finance, Insurance, & Real Estate	25
Services	26 - 31
Government	32

Special cases arose for contaminated soils and asbestos-containing wastes. These wastes are cleanup oriented and are not generated by economic activity. They would need to be cleaned up and disposed of even if all economic activity ceased. Therefore, there is no way to project the amount of waste generated under these waste numbers and the future waste calculation was not done.

A number of generators could not be identified as to the nature of their business. These generators were assigned into an SIC code of 99, representing the unclassifiable category. For these generators, which could not be identified with any specific economic activity, no projections of future waste generation were performed.

Problems Requiring Detail Analysis

Any general method will not cover all exceptions that might affect waste generation. Therefore, staff undertook careful review of each county to ensure that major waste generators have been identified and classified by each industry sector. This review is incomplete and will continue. Changes will be made before the final report is issued.

Appendix 3

Reality Check:

Hazard Classification of California Waste Category Codes

REALITY CHECK HAZARD CATEGORIZATION

HIGH HAZARD CATEGORY (100)

711. Liquids with cyanides > = 1000 Mg./L
721. Liquids with arsenic > = 500 Mg./L
722. Liquids with cadmium > = 100 Mg./L
723. Liquids with chromium (VI) > = 500 Mg./L
724. Liquids with lead > = 500 Mg./L
725. Liquids with mercury > = 20 Mg./L
726. Liquids with nickel > = 134 Mg./L
727. Liquids with selenium > = 100 Mg./L
728. Liquids with thallium > = 130 Mg./L
731. Liquids with polychlorinated biphenyls > = 50 Mg./L
741. Liquids with halogenated organic compounds > = 1000 Mg./L
751. Solids or sludges with halogenated organic compounds > = 1000 Mg./Kg.
791. Liquids with ph < = 2
792. Liquids with ph < = 2 with metals
801. Waste potentially containing dioxins
231. Pesticide rinse water
232. Pesticides and other waste associated with pesticide production
261. Polychlorinated biphenyls and material containing PCBs
481. Tetraethyl lead sludge
551. Laboratory waste chemicals

MODERATE HAZARD CATEGORY (10)

111. Acid with metals
112. Acid no metals
113. Unspecified acid
121. Alkaline solution (ph > = 12.5) with metals
122. Alkaline solution without metals ph > = 12.5
123. Unspecified alkaline solution
131. Aqueous solution (2 < ph < 12.5) containing reactive anions
132. Aqueous solution with metals
133. Aqueous solution with total organic residues 10 percent or more
134. Aqueous solution with total organic residues less than 10 percent
135. Unspecified aqueous solution
141. Off-specification, aged, or surplus inorganics
161. FCC waste
162. Other spect catalyst
171. Metal sludge (see 121)
172. Metal dust (see 121) and machining waste
181. Other inorganic solid waste
211. Halogenated solvents
212. Oxgenated solvents
213. Hydrocarbon solvents

214. Unspecified solvent mixture
221. Waste oil and mixed oil
222. Oil/water separation sludge
223. Unspecified oil-containing waste
241. Tank bottom waste
251. Still bottoms with halogenated organics
252. Other still bottom waste
271. Organic monomer waste (includes unreacted resins)
272. Polymeric resin waste
281. Adhesives
311. Pharmaceutical waste
322. Biological waste other than sewage sludge
331. Off-specification, aged, or surplus organics
341. Organic liquids (nonsolvents) with halogens
342. Organic liquids with metals (see 121)
343. Unspecified organic liquid mixture
351. Organic solids with halogens
352. Other organic solids
441. Sulfur sludge
511. Empty pesticide containers 30 gallon or more
541. Photochemicals/photoprocessing waste
571. Fly ash, bottom ash, and retort ash

SLIGHT HAZARD CATEGORY (1)

151. Asbestos-containing waste
291. Latex waste
321. Sewage sludge
411. Alum and gypsum sludge
421. Lime sludge
431. Phosphate sludge
451. Degreasing sludge
461. Paint sludge
471. Paper sludge/pulp
491. Unspecified sludge waste
512. Other empty containers 30 gallons or more
513. Empty containers less than 30 gallons
521. Drilling mud
531. Chemical toilet waste
561. Detergent and soap
581. Gas scrubber waste
591. Baghouse waste
611. Contaminated soil from site clean-ups
612. Household wastes
613. Auto shredder waste

ABAG ASSOCIATION OF BAY AREA GOVERNMENTS
P.O. Box 2050
Oakland, CA 94604-2050

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